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INTERNATIONAL SHARING OF POLAR INFORMATION RESOURCES

BPRC REPORT No. 4

PROCEEDINGS OF THE 14TH POLAR LIBRARIES COLLOQUY

MAY 3-7, 1992

BYRD POLAR RESEARCH CENTER

The Ohio State University

INTERNATIONAL SHARING OF POLAR INFORMATION RESOURCES:

PROCEEDINGS OF THE 14TH POLAR LIBRARIES COLLOQUY

MAY 3-7, 1992
BYRD POLAR RESEARCH CENTER
THE OHIO STATE UNIVERSITY
COLUMBUS, OHIO, U.S.A.

Lynn B. Lay and Lynn Tipton Everett, Editors

November 1992

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The Ohio State University
1090 Carmack Road
Columbus, OH 43210
U.S.A.

Copies of this Report may be obtained from The Goldthwait Polar Library at the above address.

Dedication

The Byrd Polar Research Center at The Ohio State University is saddened to report the deaths of two of their past directors and staunch supporters of the Goldthwait Polar Library. Dr. Richard P. Goldthwait suffered a cerebral stroke while collecting water samples near his home in New England. He died on July 7, 1992. Dr. Goldthwait was the founder of the Institute of Polar Studies and its first director. The Goldthwait Polar Library is named in his honor, as it was his personal collection of books, reprints and journals which initially formed the nucleus of the library.

Dr. Emanuel D. Rudolph died on June 22, 1992 as a result of head injuries suffered in a traffic accident. Dr. Rudolph was the third director of the Institute of Polar Studies and an emeritus professor of plant biology at The Ohio State University. He was an avid book collector and long time friend of the libraries. His exceptional personal collection of polar books has been given to the Goldthwait Polar Library.

The Center had a rededication of the Goldthwait Polar Library in its new facility during the 14th Polar Libraries Colloquy; we were extremely fortunate that both Doc G and Rudy were able to attend. We will miss their constant support and guidance. These proceedings are dedicated to Dr. Richard P. Goldthwait and Dr. Emanuel D. Rudolph.

The Editors

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FOREWORD

The 14th Polar Libraries Colloquy was held in Columbus, Ohio, May 3-7, 1992 under the sponsorship of the Byrd Polar Research Center of The Ohio State University. Approximately eighty people attended the colloquy which brings together biennially an international community of librarians, archivists, and information management specialists.

The 14th Colloquy served as a forum for sharing information on current international initiatives which aid in the bibliographic control of polar literature, especially *gray literature*. Through the course of discussions, participants identified the need for additional international cooperation to facilitate information exchange. They also recognized that effective exchange requires a framework of compatible formats and databases. This represents an important initiative in furthering the broad objective of allowing transparent access by the user community to the international collection of polar information and data.

I want to acknowledge the work of Ms. Lynn Lay who convened the Colloquy and Ms. Lynn Everett who assisted throughout the meeting. They, along with support staff for the Byrd Center and the Conference and Institutes Staff worked hard to make sure the Colloquy was a success. Financial support for the Colloquy itself and for this publication was provided by National Science Foundation Grant No. DPP-9120382 to The Ohio State University.

Kenneth C. Jezek
Byrd Polar Research Center

ACKNOWLEDGEMENTS

The editors wish to thank the members of the Colloquy Organizing Committee and the Local Colloquy Organizing Committee; Kenneth Jezek, Rae Mercier, Linda Buchan, Abby Halcie, Kathleen Doddroe and John Nagy from the Byrd Polar Research Center for their help in making the 14th Polar Libraries Colloquy successful. Tapio Salo and Ken Grossi generously donated their photographs. The Friends of the Byrd Polar Research Center hosted the reception for the Rededication of the Goldthwait Polar Library and the National Science Foundation Grant No. DPP-9120382 supported Colloquy preparations, participants and these Proceedings.

14th Polar Libraries Colloquy Organizing Committee

Martha Andrews
Philip Cronenwett
Nicholas Flanders
Ross Goodwin
Nancy Liston
Paul McCarthy
William Mills
Ann Brennan Thomas
David W.H. Walton
Sharon M. West

14th Polar Libraries Colloquy Local Organizing Committee

Peter J. Anderson
Regina Brown
Kaye R. Everett
Lynn Tipton Everett
Steve Forman
Lynn Lay
Emanuel D. Rudolph*

* deceased

INTRODUCTION

The 14th Polar Libraries Colloquy (14 PLC) was held in Columbus, Ohio on May 3-7, 1992 and hosted by the Goldthwait Polar Library and the Byrd Polar Research Center of The Ohio State University. Approximately 80 people attended the meeting, with representation from ten countries. The Program began with a buffet dinner at COSI, which featured an antarctic exhibit, *Antarctica: A Family Expedition to the South Pole*. The meeting consisted of six sessions where contributing papers were presented, one poster session, database demonstrations, an excursion to tour the OCLC Online Computer Library Center, Inc. facility in Dublin, Ohio, and a reception at the Goldthwait Polar Library. The Colloquy was supported by National Science Foundation Grant No. DPP-9120382.

Background Information about the Polar Libraries Colloquy

The Polar Libraries Colloquy, formerly the Northern Libraries Colloquy, provides an opportunity for international polar information specialists, librarians and users of polar information to discuss projects of mutual interest and work toward common goals. The first Colloquy was held at the Boreal Institute for Northern Studies in 1971. The meeting was a success and subsequent meetings were planned every year until 1976, at which time it was determined that biennial meetings were preferable, allowing more time to act on recommendations and accomplish specific projects.[1] The locations of the meetings alternated between North America and Europe, a tradition which still continues. Usually the Colloquy meets at a polar library of research center. While the Colloquy is informally structured, many collaborative projects have been started, due in part to ideas presented at past colloquies. These cooperative projects help to maintain continuity from one colloquy to the next, although it is ultimately the hosting institution's responsibility to plan the program for the Colloquy.

The next Colloquy will be held in 1994 in Cambridge England and convened by the Scott Polar Research Institute and the British Antarctic Survey. For more information about the 15th Polar Libraries Colloquy, contact Mr. William Mills or Ms. Christine Phillips (see the Participant List for complete addresses).

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[1] Cooke, G.A., 1990. "A brief history of the Polar Libraries Colloquy," *in Man's Future in Arctic Areas: Proceedings of the 13th Polar Libraries Colloquy*, R. Kivilahti, L. Kurppa and M. Pretes, *eds*., Arctic Centre, University of Lapland, Rovaniemi, Finland, p. 10-13.

Colloquy Theme

The theme of the 14th Polar Libraries Colloquy was *International Sharing of Polar Information Resources*. This theme was chosen for several reasons. One of the common goals of the Colloquy is to make arctic, antarctic, and cold regions information more accessible. Papers presented at past colloquies have demonstrated that this goal may be accomplished in different ways. One method is to merely inform the Colloquy participants of individual collections and maintain informal contacts with others. Another method is to plan coordinated projects, which in order to be effective, depend upon individual and institutional commitment to the venture. For example, at the 12th Northern Libraries Colloquy in Boulder, Colorado, a recommendation was made that the group produce a union list of serial holdings. Once compiled, this union list was to be widely distributed and used for interlibrary loan purposes and collection development. The response was overwhelming; a majority of those in attendance submitted their serial holdings lists or data files to be used for the union list compilation. As a result of this cooperation, serial holding records are now one component of *PolarPac*, the CD-ROM database.

The program of the 14 PLC strived to continue the efforts and progress made at the 12th and 13th Colloquies by providing an opportunity to encourage national and international cooperation in making arctic, antarctic and cold regions information more accessible. The theme also supports Section 102.(A)(12) of the *Arctic Research and Policy Act of 1984* (PL 98-373) which recognizes the need for efficient management and transfer of arctic information.

Colloquy Planning

On April 6, 1991 a planning meeting for the Colloquy was held in Hanover, New Hampshire, in conjunction with a meeting of the U.S. Polar Bibliographic Information Working Group. Representatives from Canada and the United Kingdom were also present. Those present at the meeting, discussed a tentative agenda for the 14 PLC and offered their comments concerning the content and scope of the Colloquy. They agreed to be considered part of the planning process by volunteering to participate as the Program Planning Committee. Several constructive ideas were presented and many of their ideas were incorporated into the program.

The Proceedings

Participation at the Colloquy was open to anyone who wanted to submit a paper or a poster within the general framework of international sharing of polar information. There are forty-four papers in this volume, some of which were not presented at the Colloquy. Abstracts for the poster session are included in this volume.

Dr. Kenneth Jezek welcomed the participants to Columbus and the Byrd Center. As a user of polar information, he challenged the participants to consider a management role in making newly acquired data and information accessible to the larger community of researchers, modelers and policy makers.

We were fortunate to have Dr. Trudy Huskamp Peterson from the U.S. National Archives and Records Administration present the Colloquy's keynote address. Her presentation, *Dangerous Archives*, focused on polar archives and the archivist's duty to maintain the rights of individuals. Her ideas were thought-provoking and it was a privilege to hear her speak on such a stimulating subject.

Accomplishments

One of the goals of the Colloquy was to share information on current international initiatives which aid in the bibliographic control of polar literature. To a great extent we succeeded in this respect. In Session I of the Colloquy, several papers focus on specific databases and database products which are currently being produced or are now in the design stages. The Canadian Polar Information System, The U.S. Polar Bibliographic Information System and *PolarPac* and *Arctic and Antarctic Regions CD-ROM* are examined in great detail as is the *BIBSYS* from Norway, the Regional Information System of the Russian North and the modernization of the Cold Regions Bibliography Project and the *Antarctic Bibliography*. Future goals and considerations were highlighted.

One area of immense concern, particularly to the user community, is the issue of accessibility of non-bibliographic information resources, such as digital data. This was not adequately addressed at this colloquy, but perhaps it can be a topic of discussion at the 15th Colloquy in Cambridge.

Collaborative efforts between institutions generated much discussion. The task of increasing access to polar information is multifaceted and therefore if a polar information system or network is to be truly comprehensive, input on an international scale is a necessity. No one library or institute has all the resources necessary to make the networking plan work. Philip Cronenwett presented a proposal to the participants concerning an idea for a much needed international cooperative effort to find, identify, catalog and make available to researchers information about polar archival collections. Anatoly Vinogradov discussed the extensive collaborative efforts of the Kola Science Centre, the Arctic Centre at the University of Lapland and the Rasmuson Library of the University of Alaska Fairbanks. *PolarPac* and the *Antarctic and Arctic Regions NISC CD-ROM*, while designed to serve slightly different purposes, exemplify collaborative efforts between institutions and vendors. Representatives from both WLN and the NISC Corporation attended the Colloquy and encouraged discussion and answered questions.

Sharing information on specific collections was also much in evidence. Papers included discussions of one small collection within a larger collection or one significant aspect or project within a larger program. What resources can be utilized for specific information on a specific topic were also examined at great length. All of these papers help to establish a broad picture of the types of polar information available for research and also to raise questions concerning whether or not the needs of the users are being met. The papers in this volume illustrate the scope or the variety of polar information resources, some of which have yet to receive consideration in a networking plan.

Session Six of the Colloquy was devoted to whether or not the Colloquy should become a formal organization. Nicholas Flanders organized the session and Ann Christine Haupt was the moderator. Ann Brennan Thomas spoke for leaving the Colloquy as it is, and William Mills spoke in support of a more structured organization. The participants were then invited to add their comments and make suggestions. The debate was not officially resolved, however, at the Business meeting on Thursday, Phil Cronenwett, the Chair of the "Committee for Formalization," submitted a draft proposal. After much discussion, the proposal, *Polar Libraries Colloquy Guiding Principles*, was endorsed by a majority of participants. The document follows the minutes of the Business Meeting in these proceedings. William Mills presented another proposal, which calls for participants to "accept in principle the need to adopt formal structures to assist common action on initiatives raised during or between colloquies by colloquy members; and that a working party be established to propose appropriate structures at the 15th Polar Libraries Colloquy." A "working party" was established to investigate this matter and will report at the 15th Polar Libraries Colloquy.

At the Business Meeting, Martha Andrews displayed a copy of *A Proposed Plan of Action for Participants of the Polar Libraries Colloquy*, which was endorsed at the 12th Colloquy in Boulder. Modifications were made and there was reaffirmation of the vision:

VISION: To provide polar information users easy and effective access to all polar-related bibliographic data bases, expand data base cover to subject or geographic areas not adequately covered, minimize the need for duplicate effort and develop dependable links to their international institutions that provide bibliographic data bases in order to expand access and ease of use.

While the Colloquy participants have made significant strides in increasing access to polar information, more collaboration on an international scale is necessary to effectively realize the vision set forth in the *Plan of Action*. The papers in these proceedings identify many new avenues for possible international collaboration and participation.

Lynn Lay

PROGRAM

14th Polar Libraries Colloquy

International Sharing of Polar Information Resources

Sunday May 4, 1992

4:00-6:00 PM	Registration at the Hotel.
6:15 PM	Buses leave the Ramada University Hotel for COSI.
7:00-7:30 PM	Reception at COSI (COSI Exhibit: *Antarctica: A Family Expedition to the South Pole*).
7:30-9:30 PM	Buffet Dinner at COSI.
9:30 PM	Buses return to the Ramada University Hotel.

Monday May 5, 1992

8:00 AM	Buses leave Ramada University Hotel for Scott Hall.
8:15-8:30 AM	Registration.
8:30-8:45 AM	Welcome Address, by Kenneth Jezek (Director, Byrd Polar Research Center).
8:45-9:30 AM	*Dangerous Archives*, Keynote Address, by Trudy Huskamp Peterson (National Archives and Records Administration).

SESSION I:
Cooperative Databases and Database Products
Chair: Ross Goodwin, Arctic Institute of North America

9:40-10:00 AM	*Implementation of a U.S. Polar Bibliographic Information System*, by Paul McCarthy (Rasmuson Library, University of Alaska Fairbanks) and Martha Andrews (Institute of Arctic and Alpine Research).

Monday May 5, 1992

SESSION I:
Cooperative Databases and Database Products
Chair: Ross Goodwin, Arctic Institute of North America

10:00-10:20 AM	*An Analysis of the Content of the PolarPac Database Using WLN Collection Analysis Service*, by Sharon M. West (Rasmuson Library, University of Alaska Fairbanks).
10:20-10:35 AM	Break.
10:35-10:55	*The NISC Arctic and Antarctic Regions CD-ROM*, by Fred Dürr (NISC Corporation).
10:55-11:15 AM	*Contrasts in Coverage: An Examination of the Polar Databases on the NISC CD-ROM*, by William Mills (Scott Polar Research Institute).
11:15-11:35 AM	*Arctic Data Interactive: A Prototype of an Electronic Science Journal*, by Denise Wiltshire (U.S. Geological Survey).
11:35-11:55 AM	*The NOAA LINC Catalog CD-ROM and Information Network*, by Janice Beattie (NOAA Library).
12:00-1:00 PM	Lunch at Mount Hall.
1:00-1:20 PM	*Modernization of the CRREL and Antarctic Bibliography Production*, by Stuart Hibben (Library of Congress).
1:20-1:40 PM	*Building a Canadian Polar Information System*, by Robin Minion (Canadian Circumpolar Library) and Ross Goodwin (Arctic Institute of North America).
1:40-2:00 PM	*Cold Climate Research in Finland and in the Kola Area in the Soviet Union--A New Product, a Bibliography and Database "Snow White"*, by Heli Saarinen (Lapland Provincial Library) and Liisa Kurppa (Arctic Centre, University of Lapland).
2:00-2:20 PM	*Databases and Communications in the Regional Information System on the European North of the Soviet Union*, by Vladimir Putilov (Kola Science Centre).

Monday May 5, 1992

SESSION I:
Cooperative Databases and Database Products
Chair: Ross Goodwin, Arctic Institute of North America

2:20-2:35 PM	Break.
2:35-2:55 PM	*Contract Indexing of Industry and Government Gray Literature at ASTIS*, by Ross Goodwin (Arctic Institute of North America).
2:55-3:15 PM	*Permafrost Information and Data Management Activities of the National Snow and Ice Data Center*, by Ann Brennan and Claire S. Hanson (National Snow and Ice Data Center).
3:15-3:35 PM	*Technology Helping to Preserve and Access Oral Recordings*, by William Schneider and Dan Grahek (Rasmuson Library, University of Alaska Fairbanks).
3:35-5:00 PM	Demonstrations of Databases and Database Products in the Goldthwait Polar Library, (176 Scott Hall).
5:00 PM	Buses return to the Ramada University Hotel.

Tuesday May 5, 1992

8:00 AM	Buses leave Ramada University Hotel for Scott Hall.

SESSION II:
Polar Archival Resources
Chair: Anne Morton, Hudson's Bay Company Archives

8:40-9:00 AM	*Florence Nupaaq Melwotok Sketches: A Rare Archival Record from the Pen of a Yup'ik Woman*, by David A. Hales (Rasmuson Library, University of Alaska Fairbanks).

Tuesday May 5, 1992

SESSION II:
Polar Archival Resources
Chair: Anne Morton, Hudson's Bay Company Archives

9:00-9:20 AM	*Anthropological Resources of the Manuscript Collections, Rasmuson Library, University of Alaska Fairbanks*, by C. Eugene West (Rasmuson Library, University of Alaska Fairbanks).
9:20-9:40 AM	*Rediscovering Russian America: Archival Sources of the Rasmuson Library, University of Alaska Fairbanks*, by Tamara Lincoln (Rasmuson Library, University of Alaska Fairbanks).
9:40-10:00 AM	*Archival and Other Data for an Antarctic Chronology*, by Robert K. Headland (Scott Polar Research Institute).
10:00-10:20 AM	Break.
10:20-10:40 AM	*An Integrated System for Describing Archives and Manuscripts: Is This Feasible for Collections at Polar Libraries*, by Albert W. Fowler (Rasmuson Library, University of Alaska Fairbanks).
10:40-11:00 AM	*Documentation Strategy and the Archival Challenge of Polar Exploration and Scientific Investigation*, by Raimund E. Goerler (Byrd Polar Research Center).
11:00-11:20 AM	*Polar Archival Records: A Modest Proposal*, by Philip N. Cronenwett (Dartmouth College Library).
11:20-11:40 AM	*The Byrd Polar Research Center Archival Program: The Papers of Rear Admiral Richard E. Byrd and Sir Hubert Wilkins*, by Ken Grossi (Byrd Polar Research Center).
12:00-1:00 PM	Lunch at Mount Hall.
1:00-2:30 PM	*Circumarctic Map of Permafrost and Ground Ice Conditions: A Status Report*, by Jerry Brown (IPA Editorial Committee), O. J. Ferrians, Jr. (U.S. Geological Survey), J. A. Heginbottom (Geological Survey of Canada) and E.S. Melnikov (Ministry of Geology, Russia).

Tuesday May 5, 1992

SESSION II:
Polar Archival Resources Poster Session
Chair: Anne Morton, Hudson's Bay Company Archives

1:00-2:30 PM	*Sir Hubert Wilkins: His Adventures and His Contributions to Science*, by Ken Grossi (Byrd Polar Research Center).
	Saving the Past: The Hudson's Bay Company Nitrate Negative Project, by Anne Morton and Marcia Boey (Hudson's Bay Company Archives).
	The British Antarctic Survey Archives, by Martin Vine (British Antarctic Survey Archives).
2:30-3:00 PM	Break.

SESSION III:
Antarctic Treaty System and Antarctic Literature
Chair: David W.H. Walton, British Antarctic Survey

3:00-3:30 PM	*An Introduction to Current Antarctic Research*, by David W.H. Walton (British Antarctic Survey).
3:30-3:40 PM	*The Contribution of SCAR to Antarctic Scientific Information*, by David W.H. Walton (British Antarctic Survey).
3:40-4:00 PM	*NSF's Role in Polar Information*, by Guy G. Guthridge (National Science Foundation, Division of Polar Programs).
4:00-4:20 PM	*The International Antarctic Centre in New Zealand: A Cooperative Approach to Information Sharing*, by George A. Knox (International Antarctic Centre).
4:20-4:40 PM	*Environmental Management in Antarctica: A Guide to the Literature*, by Janice Meadows (Scott Polar Research Institute).
5:00 PM	Buses return to the Ramada University Hotel.

Wednesday May 6, 1992

8:00 AM	Buses leave the Ramada University Hotel for OCLC in Dublin, Ohio.
8:30-9:15 AM	Coffee and donuts at OCLC.

SESSION IV:
End Users of Polar Information
Chair: Martha Andrews, Institute of Arctic and Alpine Research

9:15-9:35 AM	*Information Seeking Behavior of Scientists and Graduate Students at the Institute of Arctic and Alpine Research*, by Martha Andrews (Institute of Arctic and Alpine Research).
9:35-9:55 AM	*Ecological Information: A Dialog Between Producers and Users*, by Nina G. Dobrynina (All-Union Research Institute on Nature conservation and Reserves).
9:55-10:15 AM	*The Canadian Polar Information System User Survey*, by Ross Goodwin (Arctic Institute of North America) and Robin Minion (Canadian Circumpolar Library).
10:15-10:35 AM	*Are Your Roots in Haparanda Sweden?: The Origin and Use of Demographic Individual-Based Data on Different Levels*, by Tapio Salo (Haparanda Library, Sweden).
10:35-10:55 AM	Break

Wednesday May 6, 1992

SESSION IV:
End Users of Polar Information
Chair: Martha Andrews, Institute of Arctic and Alpine Research

10:55-11:15 AM	*I Suppose You Haven't Got This, But ...: Some Thoughts on Building Up a Good Glaciological Collection*, by Ailsa D. Macqueen (World Data Centre "C", Glaciology, Scott Polar Research Institute).

Wednesday May 6, 1992

SESSION IV:
End Users of Polar Information
Chair: Martha Andrews, Institute of Arctic and Alpine Research

11:15-11:35 PM	*Information Acquisition and Use by Antarctic Scientists: A Case Study Conducted at the British Antarctic Survey*, by Christine Phillips (British Antarctic Survey).
11:35-11:55 PM	*Reprint Collecting in the Culture of Science*, by Tom Moritz (California Academy of Sciences Library).
12:30-1:30 PM	Lunch at the OCLC Cafeteria.
1:30-3:00 PM	Tour of OCLC.
3:00 PM	Buses leave OCLC to return to the Ramada University Hotel.

Thursday May 7, 1992

8:00 AM	Buses leave the Ramada University Hotel for Scott Hall.
8:30-8:50 AM	*WLN and PolarPac: A Happy Collaboration*, by Ron Miller (WLN Bibliographic Information Services).

SESSION V:
Editors of Polar Journals
Chair: Ron Inouye, Rasmuson Library, University of Alaska Fairbanks

9:00-11:00 AM **Panel Participants:**

Jerry Brown (IPA Editorial Committee)
Karen M. McCullough (Arctic Institute of North America)
Winifred Reuning (National Science Foundation)
Kathleen A. Salzberg (Institute of Arctic and Alpine Research)
David W.H. Walton (British Antarctic Survey)

Thursday, May 7, 1992

SESSION VI:
Should the Colloquy Become a Formal Organization?
Chair: Nicholas Flanders, Arctic Centre, University of Lapland

11:00 AM- for 12:15 PM	Both sides of the issue will be presented and there will be time discussion from the participants.
12:15-1:15 PM	Lunch at Mount Hall.
1:15-3:15 PM	**Business Meeting for the 14th Polar Libraries Colloquy**
3:15-4:00 PM	Tour of the Byrd Polar Research Center.
4:00-6:00 PM	Closing Reception at the Goldthwait Polar Library.
6:00 PM	Buses return to the Ramada University Hotel.

14th POLAR LIBRARIES COLLOQUY
BUSINESS MEETING, THURSDAY, MAY 7, 1992

Chaired by Martha Andrews
Summary prepared by Martha Andrews

1. **Colloquy publications & communications**

   Proceedings of the 14th Polar Libraries Colloquy. Lynn Lay asked for all papers to reach her before July 1, for publication by October 1, 1992.

   Polar Libraries Bulletin update; editors Nancy Lesh and Kay Shelton. Kay Shelton asked for all items for PLB no. 42 to be sent to her or Nancy Lesh by June 30, 1992.

   The colloquy approved a vote of thanks to the Alaska State Library for its support of the bulletin since its inception in 1971. A letter acknowledging this support will be written by William Mills.

   Polar and Cold Regions Library Resources: a Directory. Update. Ann Brennan reminded the group that the last edition of this directory was in 1985. She offered, with Martha Andrews, to produce an updated directory for the 15th Polar Libraries Colloquy. No objections were raised.

   Union List of Polar Libraries Serials - hard copy from WLN? Sharon West counted those persons interested in obtaining a hard copy of this list; she will report via PLB on the availability and cost.

   Polar.lit electronic bulletin board. The polar.lit bulletin board on Omnet will continue; colloquy participants were prevailed upon to start contributing more often. A discussion of placing the board simultaneously on the Internet resulted in Rasmuson Library taking the responsibility of making this possible. Janice Beattie offered to forward the specifications by which the IAMSLIC group has done this with their bulletin board.

2. **Colloquy archives status**

   Eugene West offered to take responsibility for the Colloquy archives at Rasmuson Library. He will review their existing status and solicit all previous colloquy chairs to submit the archives from the 14 colloquies. Contributions are also welcome from any individual wishing to send them, with documentation.

3. **"Committee for formal organization"**

Phil Cronenwett, committee chair, submitted a draft for consideration. A lengthy discussion ensued, resulting in several changes in wording. "Polar Libraries Colloquy Guiding Principles" were endorsed by a majority vote of colloquy participants present. This document is published following these minutes.

4. **Recommendations from Participants**

a. William Mills presented a proposal following up on the "Guiding Principles" approved under 3. above. After an amendment by Nita Cooke was voted down, the following proposal was approved by majority vote of colloquy participants present:

Proposed: That members of the Polar Libraries Colloquy accept in principle the need to adopt formal structures to assist common action on initiatives raised during or between colloquies by colloquy members; and that, a working party be established to propose appropriate structures at the 15th Polar Libraries Colloquy.

A "working party" was formed consisting of the following persons:
William Mills, _ex officio_
Janice Meadows
Ross Goodwin
Kay Shelton
Lisa Kurppa
Martha Andrews

This group will report at the 15th Polar Libraries Colloquy.

b. Martha Andrews displayed a copy of "A proposed plan of action for participants of the Polar Libraries Colloquy" endorsed at the 12th Northern Libraries Colloquy. She requested modifications and reaffirmation of this vision. After word changes, the vision was approved to read as follows:

A PROPOSED PLAN OF ACTION FOR PARTICIPANTS OF THE POLAR LIBRARIES COLLOQUY

VISION: To provide polar information users easy and effective access to all polar-related bibliographic data bases, expand data base coverage to subject or geographic areas not adequately covered, minimize the need for duplicate effort and develop dependable links to other international institutions that provide bibliographic data bases in order to expand access and ease of use.

5. **15th Polar Libraries Colloquy**

   William Mills and Christine Phillips jointly presented a letter from Dr. D.J. Drewry, Director of the British Antarctic Survey, and Dr. P. Wadhams, Director of the Scott Polar Research Institute. This letter invited the Colloquy to the 15th Polar Libraries Colloquy in Cambridge, England in 1994. The colloquy accepted this invitation with pleasure.

6. **Thanks to the organizers of 14th Polar Libraries Colloquy**

   On behalf of the colloquy participants, Nicholas Flanders thanked the local organizing committee. Nita Cooke presented gifts to Lynn Lay for the committee, herself, and for the Goldthwait Polar Library. Lynn Lay, Program Director for the 14th Polar Libraries Colloquy, accepted the kudos, extended thanks to the Program Planning Committee, and thanked everyone present for participating.

7. A group photograph was taken at lunchtime and will be distributed.

POLAR LIBRARIES COLLOQUY
GUIDING PRINCIPLES

Founded in 1971 as the Northern Libraries Colloquy, the Polar Libraries Colloquy is a forum for individuals and institutions to discuss issues and ideas relating to the collection, preservation, and dissemination of polar information.

I. The name of this organization shall be the Polar Libraries Colloquy.

II. Membership in the Colloquy shall be open to any individual or institution evidencing an abiding interest in the collection, preservation, and dissemination of polar information.

III. The Colloquy shall appoint a Chair who shall be the representative from the institution hosting the forthcoming or current Colloquy. It is the responsibility of the Chair to call, organize, and host the Colloquy at her or his institution. The Chair shall remain in office through the end of the Colloquy proceedings at which point the new Chair shall take office.

IV. The Colloquy shall meet biennially at a place to be determined by the members.

V. An institution or site wishing to host the Colloquy should inform the Chair at least sixty days prior to the current Colloquy. If more than one site or institution offers an invitation, the Chair shall inform each institution of the potential conflict. The evaluation of the site of the Colloquy shall be considered by a committee composed of the current Chair and Chairs of three preceding Colloquies. The tradition of alternating between Europe and North America shall be considered in site selection with due consideration given to other areas as evidence of interest becomes apparent.

The committee evaluating the site shall consider the following guidelines. The potential host institution should have:

A. a demonstrated, on-going commitment to the aims of the Colloquy;
B. the ability to provide a suitable venue including appropriate accommodations and meeting facilities, and relevant and interesting sites to visit;
C. a significant polar collection;
D. a record of successfully hosting international conferences;
E. a letter of invitation from the governor of the institution;
F. evidence of institutional commitment, both financial and physical;
G. a suitable topic for the Colloquy; and
H. a commitment to publish the proceedings.

Consideration shall be given to appropriate sites that have not yet hosted the Colloquy.

The committee shall evaluate the potential sites and recommend to the Colloquy one site that the committee believes to be most appropriate. The Colloquy will, at its current meeting, consider the recommendation.

VI. A member, either individually or representing an institution, wishing to present business before the Colloquy at its business meeting shall provide that information in writing to the Chair thirty days prior to the Colloquy so that it can be distributed to Colloquy attendees prior to the business meeting.

WELCOME ADDRESS
FOR THE 14TH POLAR LIBRARIES COLLOQUY

Kenneth Jezek
Director, Byrd Polar Research Center
The Ohio State University
Columbus, Ohio 43210

On behalf of the Byrd Polar Research Center, I would like to extend to you a warm welcome to The Ohio State University and to the opening of the 14th Polar Libraries Colloquy. This is a special meeting for us at the Byrd Center, because it is one of the first major international meetings to be hosted in our new facilities. As you will have noticed, construction is still going on but we trust that you, our friends, will be blind to unfinished work, sharing only our vision of what the Center is soon to become.

For myself, I am most eager to participate in this colloquium for two reasons. First, as one of your hosts, I remain available to assist you in making this meeting a success. Please feel free to call on any member of Center for help if you should need it.

I also have a darker reason for being keen on participating in the meeting. I am a USER. Indeed, my colleagues at each of your institutions and I are voracious users of data, manuscripts, books, maps and other sorts of information.

Now seems to be a good time to be a user because technical advances are revolutionizing our ability to gather, manipulate, archive and distribute data and higher level information products. *PolarPac* is an example of how the polar community, in particular, is playing a leadership role in utilizing new technical resources. The polar community has also played a key role in the development of several large data systems. Working with computer scientists, our colleagues have helped tailor early versions of the Cryospheric Data Management System at the National Snow and Ice Data Center, the Archive and Analysis System of the Alaska SAR Facility and the British Processing and Archiving Facility for ERS-1 altimeter data.

These mission focused data systems have many exciting attributes including on line directories, catalogues and inventories. In turn, these provide reasonably convenient access to information about the sensors used to obtain data, locations where data were acquired, the level to which data are processed and the ability to order data for later receipt in a variety of formats. Finally bibliographic information is available especially pertaining to the grey literature related to the mission of the system.

These are very encouraging developments but there are still major obstacles to the free and easy exchange of data and information. National and international policies about data in a global change context are still in a formative stage. The turmoil of the LANDSAT program and the present debate within the European and Japanese Space Agencies bear witness to the dilemmas introduced as soon as commercialization of data is discussed. Regulatory control of data is another issue. Within the U.S. it is possible to identify the existence of data with a particular agency or university data management tool. However, the user may be required to begin the search process all over again through a second agency which is actually authorized to release the data.

The former example is an issue of national priorities, but I would argue that the latter is primarily an issue of information management philosophy. Data management has traditionally been a centralized activity but this approach tends to perpetuate a proprietary view of the data. It would seem that a solution to this problem is to construct decentralized, distributed data systems wherein a user is guaranteed transparent access to any element of data wherever those data might actually reside. This is at least in principle the underlying philosophy of the US Global Change Data and Information Management System of which the Master Directory, the Global Land Information System and the Earth Observing System (EOS) Data Information System are elements. Here the objective is to standardize the interfaces that provide access to data rather than centralizing data holdings.

If distributed archives is a useful and attractive concept, then what is the lowest common denominator of a decentralized architecture? At a recent Data Forum sponsored by US Federal Agencies and the National Academy of Science the argument was put forth that the local institutional library is that factor.

Traditionally the local library has been the vehicle by which users gain access to 'conventional' types of information. To continue that service, I would argue that the local libraries are also the places to concentrate expertise for accessing the more sophisticated data and information systems now coming on line. In much the same way as I might request a book, I would like to be able to get help in accessing more novel types of data and information.

I would also argue that local libraries are the appropriate interfaces for making newly acquired data and information available to the larger community of researchers, modelers and policy makers. To borrow a phrase from Francis Bretherton, we must be the stewards of the data we collect. Indeed, the data we collect or the information we produce is worthless unless it is properly documented, archived, preserved and eventually made retrievable. Nevertheless, assuring the long term value of data seems to be the most difficult problem the data community faces, mainly because researchers have generally been poor data managers. In my view, this problem will persist unless there are individuals at the local level, probably in the local library, with the skills to assist with proper data management.

Local data management brings an added benefit because the composition of data holdings, much like the holdings of books, will reflect the common interests of resident researchers.

For example, the research laboratory adjacent to my own has developed a rich collection of AVHRR imagery exclusively over the Ross Sea Sector of Antarctica. This collection represents a sorting of the larger global data set and hence constitutes a valuable refinement of the data for Byrd Center investigators. However, at present there is no formal management of that data set nor would it likely be maintained if that investigator left the Center.

I know that each of you has come to the colloquy with your own ideas and concerns and that amongst you these span services to research in the arts, the humanities, the physical, social and the biological sciences. However, I would suggest that at least at a general level the points I have raised cross cut these discipline oriented objectives. Consequently, I would like to challenge the colloquy to consider how and whether the more traditional roles of libraries, especially polar libraries, should evolve to meet the changing needs of the user community.

Again I wish you a stimulating meeting and a pleasant visit to Columbus.

DANGEROUS ARCHIVES

Trudy Huskamp Peterson
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A very funny cartoon shows God about ready to throw a thunderbolt at the Earth. A nervous angel is pleading with him, saying, "Not America. Just think of the lawsuits." Thunderbolts are a dangerous business.

The focus of the 14th Polar Libraries Colloquy is on furthering access to information about the Arctic, Antarctic, and cold regions. One topic of consideration will be the feasibility of adding "polar archival records" to a widely shared database. Doing so would appear to support the U.S. Arctic Research Commission report of 1989, which recommended that an information system be planned "to handle publicly available scientific and technical data and information related the Arctic, including health and socioeconomic data." Nearly obscured by this formal recommendation is an important issue: what is, what should be "publicly available" of the information contained in "polar archival records."

Before discussing public availability, "polar archival records" must be defined. Then the variety of access problems that they may encompass can be identified; finally, some strategies can be outlined that may help provided access to information about the records in distinction to access to the records themselves.

Speaking Archivally: Polar Archival Records

In defining "polar archival records," the place to begin is with the document. A document, by archival definition, is recorded information regardless of medium or characteristics and has three component elements: a physical base (clay tablets, papyrus, wood, parchment, paper, film, computer tape, laser disks, and so on); an impression on the physical base, made by either manual or mechanical means (a stylus on wet clay, a pen on paper, an electrical impulse on computer tape, a laser beam on a disk, a light on chemical salts); and information conveyed by the impression upon the base. The document is the usual archival term for a single item.

Record is the next important term. All records are documents, but not all documents are records. Usually defined in the plural, records are all documentary material, regardless of physical form or characteristics, made or received and maintained by an institution or organization in pursuance of its legal obligations or in the transaction of its business.. Notice that this definition limits records to material created by an institution or organization in the course of business, thereby excluding personal papers from being considered records.

Records are unique (a university has only one set of student dossiers, a corporation has only one set of financial ledgers, and so on) and they grow naturally out of the activities of the institution (archivists say they are "organic"). Records are said to have a "life cycle": they are first current, used for the business of the day, then they become semi-current and are used only occasionally for business, and finally they are non-current and are ready for final destruction or removal to the archives.

Archives in U.S. English has three definitions: the body of records which are determined to have permanent value; the administrative unit responsible for such records; and the building where such records are located. It is perfectly possible to explain an archival job like this: "I work for the archives (institution) in the archives (building) with the archives (permanently valuable records)." Notice that just as all records are documents, all archives are records and therefore are documents, too. Further, since archives are a subset of records, archives are by definition the permanently valuable materials of an institution or organization: they are not personal papers saved for their historic significance. Archives can be divided into two major groups: public archives, usually identified by the level of government (national, state, municipal) that created the records in the archives, and private archives, encompassing the archives of businesses, churches, private colleges and universities, and all other kinds of non-governmental institutions.

But what of documents that do not originate in an institution or organization? Usually these are private or personal papers, that is, the private documents accumulated by an individual, belonging to him or her and subject to his or her disposition. Like records, these are materials that have an organic unity (the letters an individual receives, the personal insurance and income tax forms, and so forth) which occur naturally in the course of living. The key here is that the original creation and ownership of the materials is non-institutional.

Artificial collections are another part of an archivist's responsibility. These are accumulations brought together from various sources, usually to illustrate an event (e.g., anything relating to the building of the AlCan Highway), a person (e.g., anything relating to Admiral Byrd), or a set of something (e.g, the signatures of all the signers of the U.S. Declaration of Independence). These collections are the product of a predetermined and purposive collecting activity by an individual (or, very occasionally, by an organization), which may include purchase. This differs from both records and personal papers, each of which is the natural product of business or personal life and has an organic unity.

Given these basic definitions, "polar archival records" is a bit redundant. If it is archival, it must be a record. But the phrase is probably intended to encompass all three of the categories just defined: records, personal papers, and artificial collections. Further, it includes both records that are wholly evidence of the cold regions (such as the records of a scientific experiment station in the Antarctic) and records which only in part provide information about polar regions (such as the records of the U.S. Weather Bureau, which include meteorological data from Alaska); personal papers that are largely if not wholly concerned with polar regions (such as, perhaps, the personal papers of the great Finnish ethnographer U.T. Sirelius) as well as those that have significant information about the polar regions in quality but not in quantity (such as the portion of the diary of Captain James O. Cook that relates to his voyage in Alaskan waters).

In sum, "polar archival records" is an intellectual not a physical construct. It includes that portion of the holdings of archives and manuscript repositories around the world that contains information about the polar regions. It is not merely free-floating information, however: it is information embedded in a known context: it came from this agency, it is part of the papers of that individual. The content is treated in context of the creator.

"Publicly Available": or Thunderbolts in the Archives

Early in this century, the U.S. historian and archival activist, J. Franklin Jameson, remarked that being trained to be an archivist is like being trained to be struck by lightning. (Remember the angel and those thunderbolts). Admittedly, Jameson's statement is enigmatic. But lightning can strike, at least figuratively, if an archivist releases information that should be protected for one of any number of reasons. One extremely sensitive area is what type of information, if released, will violate the privacy rights of individuals. In a litigious society like the United States, the concern for protecting those privacy rights is very real. Training to avoid that particular lightning strike is essential to the professional education of archivists.

As Wilfred I. Smith, the former Dominion Archivist of Canada, points out, "An archives does not operate in isolation, and the effectiveness of its operations depends to a considerable extent on the quality of its relationship with many elements in society".[1] One of these elements is the persons named in the historical materials held by the archives. An archives' reputation for trustworthiness rests in no small part in the way its archivists handle information about persons.

A repository usually acquires historical materials in one of two ways: by internal transfer from other parts of the institution (records of the university administration transferred to the university archives, records of the state police force turned over to the state archives, for instance) or by donation from a source outside the institution. A few repositories have funds to purchase historical materials, but this remains the distinct exception to the general pattern of acquisition. When the repository acquires the records of its own institution, the institution itself will specify the access policy; donation should be documented with a legal instrument, most usually a deed of gift or a will.

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[1] W.I. Smith, "Archives Management", in *ALA World Encyclopedia of Library and Information Services*, 2nd edition, Chicago: American Library Association, 1986.

Most access policies expressed by institutions or incorporated into a transfer instrument include a provision to protect the privacy of the individuals who are mentioned in the documents. But even if the transfer paper is silent, the repository will need to consider its legal liability if it releases information that may violate the privacy of individuals. In short, privacy is a fundamental issue.

[Two other categories of information relating to cold regions may have access restrictions. One would be business information in the records of a corporation that would place the corporation at a competitive disadvantage if released. This could be anything from the results of assays by a mining company to the details of contracts with suppliers. A second would be the protectible interests of governments, such as details of plans for defenses of northern borders. These two types of information are usually much on the minds of the creators of the information when the records are transferred to an archives and the archives usually has a clear sense of what to protect. This often is not true with privacy information, where the judgement of the archivist is crucial.]

What types of historical materials relating to polar and cold regions are likely to contain information the disclosure of which may invade the privacy of an individual? To answer that question, we must look at the various ways humans have interacted in cold regions.

The Antarctic is the easiest, both because it had no native human habitation and because there is no commercial development. Here the only records that would have privacy issues would be the personnel files (including medical and psychiatric files) of the persons who worked at the stations.

Turning to cold regions and the Arctic, the picture is very much more complex. Here the human actors are native peoples; persons engaged in commerce, exploration, and science who may be in the region for fairly brief periods; and persons emigrating to settle in cold regions. Naturally, any of these persons may create a corpus of papers. Institutionally, the records that contain information about these persons include those of governments (both national and local, and specifically including records of self-governments of native peoples), businesses (such as the Hudson's Bay Company or the Russian-America Company or the various native corporations operating in Alaska); charitable, religious, and educational institutions, and so on.

Two types of information are of particular concern: information about native people found in the records of scientific enterprises and in the personal papers of scientists; and information about persons encountering the police, law enforcement, and penal systems.

It is no secret, but no less disturbing, that scientific expeditions, right up through the first decades of this century, were not sensitive to the privacy rights of the native peoples they were studying. Early cameras were toted nearly everywhere, it seems, and photographers captured an enormous variety of activities on film, from mundane life in a village to sacred ceremonies (if the photographer could wangle the way in). Research reports have ethnocentric observations about peoples and cultures, and may characterize named individual in unflattering ways. It is also possible if not likely that the personal papers of the scientists will contain further observations about the individuals.

In the United States, native peoples recently succeeded in securing the passage of a national law requiring the restitution to them of skeletons, grave goods, and certain related sacred objects.[2] Records of the museums and the scientific expeditions have been essential to the process of restitution.

From this current program of restitution arises the question of the related information found in the associated scientific records and papers. If the information has been open for years, but the person to whom the information pertains is still alive, is there justification for withdrawing the information to avoid a continued breach of privacy? And for how long must such information, if not previously made public, be withheld on grounds of privacy? Here the answer to the question is heavily dependent on national standards; for example, in the United States the right of privacy normally dies with the individual, while in Germany the new national archives law closes such information for thirty years after death. This is an extremely sensitive question, because it has the rights of native peoples and their privacy as a right in modern society on the one hand and on the other the legitimate scientific interest in studying human cultures.

The photography and reportage of the ceremonies of native peoples also raise the issue of what are the collective privacy rights of a tribe, band, clan or group. Just as individuals have privacy rights and governments have "protectible interests," do groups that hold themselves out as a unity have a comparable claim? If a repository has photographs of a tribal religious event, one in which today no photographs would be allowed, does the tribe have standing to insist that this is a private matter of an ongoing nature and, therefore, the photographs or recordings or other documents detailing that which is off-limits to persons who are not members of the tribe, should be withheld or withdrawn from public use?

Archivists often call themselves "honest brokers" between the records creators and the records users. In the case of documents relating to ceremonies, the scientists who created the documents and the current scholarly users are probably in agreement about the necessity to use the documents. The "brokerage"--if it is possible at all--is between the user community and the subjects of the records and is fraught with political sensitivities. This is probably a "brokerage" that a national political system must ultimately handle, not the archival profession.

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[2] Native American Graves Protection and Repatriation Act, 1990.

A second issue is access to police and penal records. Remote regions have often been used as places of exile, places of penalty. The U.S. State of Georgia was such a place, so was Australia, Siberia, and so forth. In addition, non-native settlers are often moved into these regions before formal governmental structures did, and a reputation of "lawlessness"--whether or not founded in fact--often followed. When official systems of justice penetrated the regions, with formal record-keeping practices firmly in tow, disproportionate numbers of native peoples may have become entangled in the law enforcement practices.

The records of all three of these situations--penal and exile camps, early settlements, and modern law enforcement--have fascinating research potential. Who was in Siberia and why, and what was the actual experience? How did the law enforcement authorities in the Nordic countries deal with the movement of the Lappish (Sami) people across the borders? Was there equivalent justice for the native and the settler? Was a type of behavior perceived as criminal or deviant if carried out by a native person, but not judged in the same way if the person was a non-native? And hundreds more.

In searching for guidance to determine what of the information about individuals in these records should be protected for the privacy of the individual involved, normal legal reasoning is useful but not sufficient. Once again, politics is involved.

Some might argue that files involving political prisoners are different--that persons who have been in these situations may actually be proud of having survived the experience and may not object--may in fact want--to have their records released to public use. But it is not a simple problem to define who is a political prisoner. I had a call recently from a researcher in Sweden seeking information about the investigations of a U.S. Native American that the researcher characterized as a "political prisoner." Whether or not I perceived the case in those terms was irrelevant: the researcher did. Many nations will have this kind of problem. And for those persons who were indeed political prisoners of governments, should the government further invade their rights by releasing the files on them?

In this regard, it has been extremely instructive to observe the German struggle to decide how to handle the files of the Stasi, the former East German secret police. At present, an individual can see a file only on himself but he can see it with no redactions. A Berliner was quoted in The New Yorker as saying, "Imagine this. You sit down, you read what your daughter said about you, you read what I said about you. You want to get a knife and kill us. But what have we really said? And by what unspeakable means did the Stasi come by this information? How can you know the truth?"[3]

One suggestion is that the files be made available to research by the public only after they are redacted--that is, information that identifies individuals is deleted. But redacting is extremely laborious unless the information is computerized. In reality, the penal and police

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[3] Jane Kramer, "Letter from Berlin", *The New Yorker*, November 1991, p. 55.

records remain largely paper files, voluminous and difficult to use. But they are essential to understanding the part those institutions have played in giving the cold regions the pattern and the reputation they have today. So long as the individuals who are the subjects of the records have privacy rights--again, the national standards are different-- the release of such records for research use is an extremely delicate question.

The Imagined Collection: Polar Archival Records

Information about polar and cold regions is scattered in repositories around the globe. And yet it is possible to conceptualize it as a whole, as an imagined collection. It is information about persons, places, things, and phenomena. It is about country, community, and authority. It is a statistical database of weather statistics maintained by a government and a diary of a nineteenth century woman in a camp. It is large and diverse, but it has a commonality of content: a geographic focus.

Conceptually it is certainly possible to build a database of descriptive information about the archival records relating to polar and cold regions. (Please notice the reference to descriptive not bibliographic data--archival description does not easily fit into systems designed to handle books and periodicals.) But perhaps the effort would be better spent on two other tasks: shared archival descriptive standards and improved network communication for existing databases. Let us briefly examine about each in turn.

For the past two years, the International Council on Archives has had an international task force working on descriptive standards for archives. The U.S. member is Sharon Thibodeau of the National Archives. The work the task force has done is very impressive, and a report from the task force is now circulating to the countries (and that is nearly every country in the world) that are ICA members. [The report is quite general, so reviewers do not see a database structure or set of naming conventions or definitions of data elements. Rather, it is a conceptual foundation, and as such will need constant refinement over many years.] It is extremely likely that the report will be adopted at the ICA meeting this September in Montreal. With that, the archival world will then have an international convention that will begin to allow archives to share information that is consistent and comprehensible across the national traditions for describing archives. It will be many years before the full benefits of such a convention can be seen, but it is an extremely positive step.

Once the report is adopted in Montreal, a group will almost surely be named to carry forward the work. The polar archives community will want to track the progress of the standards and urge institutions holding polar records to incorporate those standards in their own descriptive practices.

In many nations the practice of storing the description of records and personal papers in computer databases is already underway. In the United States, the RLIN database holds many such descriptions; within five years the U.S. National Archives plans to have dial-in access to its basic descriptions for anyone who has a personal computer and a modem. In the future we can hope that other national archives and archival systems will also make their descriptive databases available for remote access. It may be that the best scenario in the future will be to search multiple databases, built to accommodate common descriptive standards, but do it sequentially to allow nations to maintain the descriptive data and have a sense of its use. The colloquy may wish to encourage the development of such remote access systems throughout the world.

If the vision for the future is a researcher's global village, what is reasonable to do in the near term? Archivists have long been accustomed to producing guides, that is, finding aids to materials in multiple repositories that have a common pertinence (or subject). A few international guides have been produced; right now the International Council on Archives and the World Meteorological Organization are pursuing a project to gather descriptions of archival holdings worldwide that would assist researchers attempting to study climate history (information on natural climate variability and fluctuations). This would be of interest to the study of polar and cold regions. Whether other organizations would be interested in producing similar compilations on related topics could be explored, but the investment required would be substantial.

Summary

In 1988, at the United Nations General Assembly, then Soviet Union Foreign Minister Eduard Shevardnadze warned that humans were conducting "a global aggression against the very foundation of life on Earth".[4] It is that very interaction of human with environment that makes the study of polar and cold regions and peoples so revealing. Archives and personal papers are key to this study.

Much of the information for that study is public, available, statistical, scientific. It documents activity that is transforming the environment. It is critical that it be used and used well to prevent further and perhaps irreparable damage to the biosphere.

But when the research materials involve human beings, the sensitive issue of personal privacy must be considered. Just as generations of humans have not been sensitive to the natural environment, with the resulting environmental destruction, we humans have not always been sensitive to the privacy interests of us all. As administrators of research resources, we have a natural enthusiasm to share information. When the information involves persons, however, we must be sure that we are sharing responsibly. Thunderbolts can come through ozone holes.

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[4] Quoted in Daniel J. Kevles, "Some Like it Hot", *New York Review of Books*, March 26, 1992, p. 31.

IMPLEMENTATION OF A U.S. POLAR BIBLIOGRAPHIC INFORMATION SYSTEM

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Abstract

The initial phases of implementation of a U.S. polar bibliographic information system have been completed under NSF grant DPP8913041 to the University of Alaska. Progress on this project has been reported earlier, this paper will outline future goals relating to continuation of the main tasks.

The first of these tasks is to secure the continuation of the *PolarPac* CD-ROM. At issue here are: 1) the enlargement of the main file of monograph and serial titles, 2) the addition of files containing analytics, and 3) possible associated products such as a print version of the union list of polar serials. Non-bibliographic files, such as directories, are also considered. The focus and the funding of an enlarged CD-ROM product are also discussed.

The second task involves resource sharing among providers of polar information. Library services have shifted from ownership of information that MIGHT be needed, to rapid delivery of documents IDENTIFIED remotely on an electronic environment. The growing importance and availability of new access tools, such as the *PolarPac* CD-ROM, carries with it a responsibility among libraries to cooperate in building bibliographic databases. This responsibility, among polar libraries, would be more effective under negotiated agreements for distributed indexing for polar and cold regions databases. A preliminary analysis of coverage and overlap among libraries contributing holdings to *PolarPac* is used as the basis for a cooperative plan presented here.

Introduction

Before discussing the subject at hand, I will recap the effort from the first proposal at the Boulder Colloquy through *PolarPac2*, the second edition of *PolarPac*.

As you may remember, the vision and general outline for the project was developed in Boulder in 1988. Individuals at that Colloquy endorsed the effort to establish a polar information network. Martha Andrews and Paul McCarthy, representatives of the University of Colorado and University of Alaska Fairbanks, respectively, pursued the development of a U.S. Polar Bibliographic Information Network. A proposal to the National Science Foundation (NSF) was completed in the fall of 1988, and submitted in the spring of 1989. NSF previously had shown a great deal of interest in encouraging a more coordinated, cooperative, and cost effective approach to polar bibliography.

After professional review and comment, NSF funded the proposal in September of 1989. The ensuing eight moths were filled with frenetic activity in order to pull the bibliographic data together on the WLN, a bibliographic utility, and produce the first edition of *PolarPac* prior to the next meeting the Colloquy in Rovaniemi, Finland in June 1990. After the introduction of *PolarPac* at the Colloquy, more than 35 copies of the database were distributed to selected polar libraries. Institutions were selected on the basis of their interest and commitment to test the disk and their contribution of holdings to the database.

Several months later the University of Alaska Fairbanks conducted a survey of users to appraise the usefulness of the CD-ROM database, its coverage, the ease of use, and effectiveness of the software. The users were also queried as to whether they found the database useful enough to make a commitment to purchase ongoing editions of *PolarPac* in various ranges of prices. Results of the survey are reported elsewhere. As a result of the support evidenced in the survey responses, the two institutions proceeded to enhance the database by adding additional international serials from more than 30 international polar libraries and the holdings of WDC-A, the Goldthwait Polar Library at Ohio State University, and selected holdings from AEIDC at the University of Alaska Anchorage. The University of Alaska Fairbanks also added its analytics from the *Bibliography of Alaska and the Polar Regions*--more than 76,000 bibliographic citations of Alaskan and polar literature from 1973-1991. The analytics of the Oil Spill Public Information Center Library in Anchorage are also included.

As part of a strategy earlier developed, the investigators sought to make *PolarPac* essentially independent of the support of any one agency and as self sustainable as possible. In the spring and summer of 1991, negotiations were held with WLN. Discussions centered on two areas: the direction and logistics of the continued development of the database and then the costs of production, marketing, and distribution of further issues of *PolarPac*. As a result of these discussions, WLN assumed all costs for the marketing, production, and distribution of future issues of the database. The future direction and the development of additional database and associated costs continue to be the responsibility of the investigators and the interested polar library community.

PolarPac2 was issued in December of 1991. It contained 13,399 serial titles, more than 100,000 monographs with more than 189,000 holdings, and 76,000 citations from the *Bibliography of Alaska and the Polar Regions*. The marketing effort of WLN has increased the paid distribution by at least 50% with more institutions than the first edition of the database which had been distributed at no cost.

Future prospects for the development of *PolarPac* on a regional, national, and international level is based on six elements identified in an earlier paper (McCarthy, 1990): 1) market; 2) usefulness of the information; 3) currency of the information; 4) cost; 5) additional subject or geographic collections that can be added to the database; and 6) its value in resource sharing.

The four aims of the NSF funded project were: 1) to promote resource sharing of collections among polar libraries; 2) to facilitate the sharing of cataloging data; 3) to facilitate interlibrary loan among polar libraries; and 4) to allow libraries to analyze and appraise their collections so as to develop a coordinated collection development strategy. These four aims continue to be the focus of the future development of *PolarPac*. Also, the survey indicated that the inclusion of analytics providing access to specialized bibliographies developed in-house by libraries was an important area on which to focus.

Rationale for an On-line Network

<u>The U.S. Polar Bibliographic Network, if it is to be successful, cannot focus ONLY on CD-ROM, which is really a product, but rather must focus on the value and utility of a network to which all of the libraries collectively contribute their holdings and effort.</u>

The value and utility of an on-line network is often overlooked because of the more immediate gratification of CD-ROM. An interactive on-line bibliographic system allows collaborative effort that provides standards, savings, and efficiency. It permits libraries to work and interact in real time. These features are necessities for a polar bibliographic network. A network cannot be sustained solely by a CD-ROM. It requires the backup of a substantial bibliographic utility.

As we reflect on the efforts and resources contributed, libraries tend to value highly what utilities and vendors contribute to the process while libraries tend to undervalue what they contribute to a utility or, especially, to a CD-ROM product. It is very easy to overlook the investment in collections and processing by each institution which makes the sharing of data or a CD-ROM project possible. A conservative evaluation of the holdings in *PolarPac* suggest that contributing institutions share access to processed collections--a capital investment valued in excess of $16,000,000, and perhaps as high as $25,000,000--an extremely valuable resource indeed.

I would like to discuss the four primary aims of the project and cooperative indexing in the balance of the paper.

The *PolarPac* Database as a Resource Sharing Tool

A major accomplishment of our NSF proposal "Implementation of a U.S. Polar Information Network" has been to combine numerous polar bibliographical information databases into a single file on *PolarPac*.

The polar regions "special" libraries, and special collections, tend, with a few exceptions, to specialize further to a particular geographic subset of the polar/cold regions, or to a specific scientific discipline as expressed in the cold climatic regions. Collection sizes vary from a few thousand to a few tens of thousands of holdings. By combining the holdings from several libraries into a single file, the *PolarPac* database becomes a "library without walls" offering an array of unique records far greater than any single "library with walls" can offer.

The libraries contributing to *PolarPac* have, in effect, become "members" of the relevant portion of the WLN Bibliographic Information Services cataloging utility. *PolarPac* is able to provide contributing libraries with an Online Public Access Catalog (OPAC) to individual libraries, and an ILL and collection development tool through access to other libraries' collections. Finally, the importance of the "Union List of Polar Serials" as a resource sharing tool cannot be underestimated.

For the larger, more comprehensive polar regions collection or library, *PolarPac* provides access to the small, specialized collections which contain information sometimes needed, but not held, in the more general collections. For the small, mission-oriented, polar/regions library with limited financial resources, the opportunity to obtain even limited (CD-ROM only) access to the WLN bibliographic utility represents a major sharing opportunity. A study of the holdings of both large and small libraries indicates that 25-50% of the data each institution contributes is unique, with the exception of one library (West, 1990).

In the case of the Institute of Arctic and Alpine Research (INSTAAR) Reading Room, at the University of Colorado, several advantages were immediately apparent. INSTAAR conducts a high level of publicly funded research involving approximately sixty scientists from graduate students through tenured, full professors. The library must provide these researchers necessary information rapidly and accurately. The library can achieve this goal better with access to other larger polar oriented library collections. At the same time, because of its very specialized mission, the INSTAAR Reading Room is able to contribute to this group sharing by supplying documents to other libraries in the WLN group of libraries.

PolarPac as a Database for Shared Cataloging

One impetus for the development of a shared polar database was that libraries that were not previously part of a national bibliographic network could utilize records in a way not previously possible.

It is possible to access the database on-line to WLN or off-line using *PolarPac*. The software selected for *PolarPac*, LaserCat, made the use of such a database for shared (retrospective) cataloging easy. The search strategies included several user friendly features such as keyword author, title and subject searching. In addition to these were such standard library access points as LC card order number, International Standard Bibliographic Number (ISBN), and International Standard Serial Number (ISSN). It is also possible to down-load records into a local system, into a local database program, and also to print catalog cards and labels. All these features make the use of shared cataloging possible and easy.

The content of the database showed that 52% of the records were unique to the library which owned the item. That means the 48% of the items were held by at least two libraries and the record for those commonly held items could be utilized for shared cataloging.

One caution should be noted, however. The use of the shared cataloging was more probable by small, specialized libraries than by the large libraries, principally the University of Alaska Fairbanks. The nature of its collection and its collecting policies means that, by default, UAF is collecting and cataloging for other libraries. To a lesser degree, this was also true for the Alaska Resources Library.

Eighty-five per cent (1497 of 1754 records) of the INSTAAR shelf list was matched by WLN, verifying the fact that the WLN database was the proper vehicle for INSTAAR to join for the purpose of retrospective cataloging. After the initial matches were made, and holdings were attached by WLN, and *PolarPac1* was published, this CD-ROM then became a shared catalog resource. Holdings for 600 more monographs held by INSTAAR but never completely cataloged, were quickly added to the WLN database and published on *PolarPac* Version 2. Records and holdings added from INSTAAR totaled 2462 (581 unique) as of December 30, 1991.

PolarPac as a Resource to Facilitate Interlibrary Loan

While it is difficult to analyze the ILL demand on larger libraries, "proof" that the small libraries can be of assistance to the large libraries included on *PolarPac* is evidenced by the amount of interlibrary loan traffic generated at INSTAAR. While still small, there has been a dramatic increase at INSTAAR in the net outbound interlibrary loan traffic between the INSTAAR Reading Room and other WLN contributing libraries. INSTAAR's borrowing is done on the basis of *PolarPac* holdings; however, INSTAAR's lending is largely a result of its bibliographic data being available on-line on WLN or on WLN *LaserCat*, not *PolarPac*.

PolarPac as a Collection Development Tool

This possibility exists, especially between libraries located close together such as INSTAAR and WDC-A Glaciology, or where missions complement one another. The analysis of

PolarPac in terms of uniqueness and overlap, suggests that it can be used as a tool for continued discussion about coordinated collection development.

The difficulty of developing a collection development agreement between a variety of geographically dispersed libraries is a significant problem in library service.

Lack of immediate access to library books and periodicals poses a significant problem to users who traditionally have enjoyed access to a wide variety of materials immediately at hand. However, the effective purchasing power of library acquisition budgets is declining. Fewer books and periodicals are being purchased. Researchers are more and more faced with the prospect of doing without materials or encouraging libraries in coordinated collection development efforts. Up to the last year or two, the technology to permit sharing of materials quickly was either extremely expensive or not available. However, the initiation of INTERNET and availability of compression software such as Ariel that allow for quick sharing of extensive data files, holds a great deal of promise. Much more detailed analysis is required before we proceed further. Specialties are developed already in polar libraries because the majority of contributing libraries are primarily focused on a specific research mission. They are likely to acquire material of specific interest to their mission if at all financially feasible. However, an analysis of the overlapping subject areas which may be marginal to the collecting areas of each library might suggest real opportunities for coordinated collection.

Analytic Database - The Case of Five Special Libraries on *PolarPac*

WLN recently completed a custom *PolarPac* collection analysis, in four reports, as part of our NSF grant. The first report was a histogram of the records held in common by OU-BP (The Ohio State University, Byrd Polar Research Center, Goldthwait Polar Library), CoU-IA (University of Colorado, Institute of Arctic and Alpine Research Reading Room), AKU-G (the University of Alaska Fairbanks, Geophysical Institute Library), AKAAR (Alaska Resources Library), AKAFG (Alaska Dept. of Fish & Game Habitat Library), AKAFW (U.S. Fish & Wildlife Service Library), and AKAMMS (U.S. Minerals Management Service Library). WLN's analysis showed that these seven libraries held 7051 records in common; in other words, 7051 titles were held by two or more of the seven libraries. A histogram was supplied showing the various library groupings and the numbers of titles held in common. (A title report of the 7051 records was also supplied; it is three inches thick and awaits attention!)

Operating from an institutional point of view, which is not necessarily the most useful overall, Andrews selected the findings which involved the INSTAAR Reading Room. (The other numbers will be analyzed later.) Due to very low overlap between CoU-IA and AKAMMS, and CoU-IA and AKAFG, these two comparisons were eliminated. The overlap between CoU-IA and the other four libraries is shown in Table 1.

Table 1

TITLES HELD BY INSTAAR COMPARED WITH FOUR OTHER *POLARPAC* CONTRIBUTORS

A*	B	C	D	E	Total Overlap
+	+				194
+		+			173
+			+		124
+				+	56
+		+	+		74
+	+	+			56
+	+			+	54
+	+		+		46
+	+	+	+		40
+	+	+		+	12
+	+		+	+	10
+		+	+	+	3
+	+	+	+	+	7

(*)KEY TO LIBRARY NAMES

A = CoU-IA	CU Inst Arctic & Alpine Res	2,464	
B = AkAAR	AK Resources Library	22,519	Holdings
C = AkU-G	UAK Geophysical Inst	9,467	01/31/92
D = OU-BP	OSU Byrd Polar Res Ctr	2,499	on WLN
E = AkAFW	US Fish & Wildlife, Anchorage	5,962	

The highest amount of overlap for CoU-IA occurs with AKAAR, and the second highest with AKU-G. Lower incidence of overlap occurs with OU-BP and AKAFW. Other combinations illustrated on this table provide a basis for some possible collaboration between libraries as regards collection development and interlibrary loan. For instance, the complementary coverage of the polar regions provided by OU-BP and CoU-IA is interesting; from approximately equal numbers of holdings (2,499 and 2,464), only 124 titles are held in common.

This analysis can only be viewed as quite preliminary, but it does show the possibilities of more complete analysis using the title report produced by WLN. Especially in the case of the libraries located in Anchorage (4 of the 7 to be compared), the possibility of cooperative collection development exists; cooperative cataloging is already possible through WLN. PolarPac looks extremely interesting as a platform for distributed indexing or analytics. Two analytic files, *The Bibliography of Alaska and the Polar Regions* (BibAk) and the Oil Spill Public Information Center, were added to *PolarPac2*. BibAk was extremely well received by a large number of Alaskan and other U.S. polar libraries.

Distributed Responsibilities for Accessioning and Indexing

Distributing responsibilities for accessioning and indexing polar regions information is, and has long been, a goal of the Polar Libraries Colloquy. One has only to look at the various databases on the polar regions CD-ROMS to become aware of a great deal of duplicated effort. At the same time, there are many types of information not being indexed by any database provider. Progress is slowly being made to alleviate this situation; many studies have been done that show the extent of overlap among indexing organizations. At the 13th Polar Libraries Colloquy, a resolution was passed regarding distributed indexing of the Antarctic literature on the *COLD* database. Similar efforts regarding the Arctic Literature have been discussed.

The next steps to meet the challenges outlined are underway. WLN is able to provide statistics regarding overlap among the libraries contributing to *PolarPac*; similar statistics are available from other database producers. Plans are underway to present hard evidence and workable negotiations to the next meeting of USPBIWG, provided NSF funding is procured for the meeting.

Perspectives

In examining the various strategies for the development of a U.S. Polar Bibliographic Network, the investigators were guided by the following perspectives: First, the utilization of a major on-line bibliographic utility as host was seen as absolutely critical regardless of how the data was distributed. Second, the Arctic community, especially those elements within it that would purchase a specialized database on CD-ROM, was judged to be relatively small. In comparison, the Antarctic has about 1,500 serious researchers involved in various studies on a long-term basis. We gauged the number of scholars that primarily focus on the Arctic on a long-term basis to be between 2,200 and 2,600. Third, the use of CD-ROM, was seen as an attractive low cost option to distribute data, especially to libraries that might find it logistically or financially difficult to connect to the on-line utility.

Finally, given the relatively small number of both institutions and researchers involved in the Arctic, the development of *PolarPac* CD-ROM was guided by two principles. First, it was perceived that the cost should be kept as low as possible so as to provide maximum market penetration for a good product at a reasonable cost. It was judged that there would be an inverse relationship between sales and cost: the number of librarians or researchers who would purchase the database was expected to decline as the cost increased, especially given the current fiscal environment. Second, WLN would build in all of the marketing, production, and distribution costs in the final price. It was a conviction of the investigators that *PolarPac* had to be "spun off" in terms of operating costs, both to test whether it was a competitive product in the marketplace for polar information and to ensure its economic viability independent of any grant or subsidy support.

As part of the marketing test, WLN solicited pre-publication orders to determine the economic viability of *PolarPac2*. Given the volume of pre-publication orders and potential additional market, WLN decided to proceed with production in the early fall of 1991 as noted earlier.

WLN devised the pricing structure and the marketing distribution plan and proceeded in concert with the investigators to produce *PolarPac2*. WLN assumed all the cost for production, distribution, and marketing. Given recent conversations with WLN, *PolarPac2* seems to have been well received in the marketplace by its purchasers.

Implications for the Future -- Access to Information

In the future, it is not a choice of CD-ROM or on-line; both are necessary. Each has its advantages; some libraries may be able to take advantage of both. CD-ROM seems to be a very effective technique for distributing a database as previously mentioned. Its price, the ease of distribution and access, and the local control exercised by the librarian or individual researcher provides access to the bibliographic database not possible in any other way or format. As production costs decline, *PolarPac* in CD-ROM could be produced annually if purchasers find that feasible. This would measurably improve its currency.

However, the on-line environment still offers many options not possible only using CD-ROM: centralized on-line data currency standards, cost avoidance, and collaborative opportunities.

It is too easy to forget the critical role of the bibliographic utility and bibliographic processors. The combination of CD-ROM and on-line access offer the optimal convenience and effectiveness to libraries and their users. CD-ROM would provide obvious advantages to users. Low cost access to the on-line database could provide libraries with an instrument to be pro-active in terms of resource development, shared cataloging, the distribution of current analytics, and the most up-to-date interlibrary loan and resource sharing tools. Data on CD-ROM that is a year old will be substantially less valuable for libraries that require relatively current access to recently published or indexed materials. Shared cataloging and the more inter-dependent sharing of resources requires an on-line environment to access current materials for optimal use. The delay, whether it be 6-12 months given CD-ROM productions schedules, would make shared cataloging much less valuable or less possible once arctic libraries complete their retrospective efforts and catch up to near-term bibliographically.

Timeliness will become critical; the best researchers will demand up-to-date currency. While the rather small number of researchers and the limitation on funds make this combination less possible for some institutions at this time, options are developing rapidly. The inauguration of INTERNET and the proposed ability of WLN to connect via INTERNET will offer U.S. and international libraries unparalleled access to on-line databases.

Funding Additional Databases

Funding the enhancement of *PolarPac* presents a challenge. There is apparently little or no funding available to private vendors or that they are willing to risk to bring additional bibliographic information to a point where it could be added to this or other CD-ROM products unless the information is already easily available in machine readable form. Much information will remain unavailable unless additional funding is identified. The irony here is that libraries invest enormous amounts of funds in materials in cataloging and in indexing collections compared to the costs of CD-ROM technology. As noted earlier, *PolarPac* Libraries have already invested between $15-25,000,000 in the collections they have assembled. For a fraction of the investment already made, additional data on collections could be put into machine readable form so that it could be shared nationally and internationally.

There are three different possible alternatives--none of which are mutually exclusive. First, the investigators have proceeded to develop a grant proposal to add the holdings of two international libraries to the current database. Second, the negotiations could be held with WLN to raise slightly the subscription price to *PolarPac* in order to insure that a percentage of revenue would be "plowed back" to provide increased access to outstanding institutional collections. Third, the institutions could be urged to share their resources by underwriting the cost of adding their holdings to the utility themselves. This would be especially appropriate and effective if the library wants to use multiple copies of *PolarPac* to share its collection within its institution or within its political constituency. A combination of all three approaches may be both possible and practical. These will be investigated as the subsequent to the production of *PolarPac2.*

In thinking of the future of information and polar libraries, we need to reflect on apparent trends that will have substantial impact on all libraries. First, telecommunication costs will go down. Communication between polar libraries will be easier and will be accomplished at a lower cost. This will make on-line and interactive telecommunications between polar libraries more attractive, practical, and inexpensive. The use of systems such as Internet may negate many of the current apparent advantages of CD-ROM.

Second, the need for current information will increase. If libraries tolerate significant delays in acquiring or sharing information with their researchers and peer institutions, they will by outflanked by other information providers and suffer financially. Third, libraries will reach out more for information beyond their collections. Resource sharing and coordinated collection development will become increasingly important to libraries as both collection management and fiscal management tools.

Libraries will increasingly utilize the services of a variety of governmental, non-profit, and commercial information providers to meet their document delivering needs. Libraries must take advantage of the products from vendors who provide specialized polar/high latitude databases. Other vendors will provide a broad coverage of subject materials and journals of which polar materials may be an important, but small subset. For example, CARL now covers about 10,000 journals and over 100,000 citations a year and could provide bibliographic coverage and efficient document delivery for a small, yet important subset of polar literature. Faxon Finder proposes to offer a similar service with the additional possibility of identifying specific journals, titles, authors, and subjects that could be downloaded to a specialized database. Polar libraries can make commercial vendors an important part of the total effort.

Librarians will increasingly face complex "make or buy" decisions as we negotiate the literature marketplace.

An integrated network can meet many of our interests. The U.S. Polar Bibliographic Network can assist libraries in meeting these new trends or demands by developing an information strategy that incorporates planning for resource sharing, shared cataloging, interlibrary loan, coordinated collection development, and the sharing of analytic files if U.S. libraries are committed to do so. If we are to make these efforts effective, we must have some substantial impact on the control, influence, and direction of the strategy and its means. Also, we must provide a variety of means to insure the currency of information.

There is no one answer to polar information. USPBIN can offer increased access to current information on-line and on CD-ROM. Better connectivity through a coordinated Internet strategy, development of a strong contributor group, annual upgrades to the database, and the development of better software by the utility will all contribute to its effectiveness.

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AN ANALYSIS OF THE CONTENT OF THE *POLARPAC* DATABASE USING THE WLN COLLECTION ANALYSIS SERVICE

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Abstract

At the meeting of the 12th Northern Libraries Colloquy held in Boulder, Colorado, USA, in 1988, a statement of action relating to the development of an international polar information network was approved by the participants. One of the goals of the action statement was to develop an international database of citations to polar literature. Following that meeting, a grant from the U.S. National Science Foundation was awarded jointly to the University of Colorado Boulder, Institute of Arctic and Alpine Research; and the Elmer E. Rasmuson Library, University of Alaska Fairbanks to develop such a database.

Subsequent to the grant award, the resultant database was released to the polar library community in the form of a CD-ROM database. In 1990, *PolarPac1* was designed, developed and produced. Reaction to the new database was favorable, and it was decided to continue development and production with issuance of a second edition of *PolarPac*.

At the time of the *PolarPac2* mastering, October, 1991, a file was produced which was subsequently analyzed using the WLN Conspectus Service. The analysis examined subject, language, and date of publication coverage.

In this paper, an analysis of these polar holdings will be presented by subject, language, date, and by comparative data between U.S. libraries. An attempt will be made to draw some preliminary observations about the depth of polar literature available to researchers.

Introduction

Since 1988, the Rasmuson Library at the University of Alaska Fairbanks and the Institute of Arctic and Alpine Research, University of Colorado Boulder have been engaged in the building of a polar literature database (McCarthy, 1990; West, 1990). Following the issuance of this database on CD-ROM in 1990, a second edition of *PolarPac* was released in October 1991.

The *PolarPac2* database contains citations from monographs, gray literature, serials, and periodicals from 32 libraries. It also contains periodical analytic records from the Rasmuson

Library's *Bibliography of Alaska and Polar Regions* and from the Oil Spill Response Center in Anchorage, Alaska.

At this point, a set of questions came to the author's mind about the nature of polar literature. Obviously, there are several different ways of approaching this problem. Should serial and periodical analytics be examined or should the initial look at the nature of polar literature be confined to monographs? Since we had in one database the monographic records of the major U.S. polar libraries, it was decided to examine polar monographic literature only. The omission of periodical analytics obviously biases the result toward those disciplines which primarily through books and not periodicals. However, several articles have shown that an analysis of polar periodical literature is not easily undertaken and comprehensive conclusions are not easily found (Thuronyi, 1975; Young and Minion, 1988).

For several years there has been a debate over what constitutes "published monographs" in the area of polar literature as opposed to the "gray literature" (Hickok, Sokolov, Dursi, 1987; Sokolov, 1988a; 1988b). This paper will not delve into that debate, but instead will state arbitrarily that, for the purposes of this paper, a published monograph is any item or set or items that has printed once with no intent of being continued. In this case, printing includes publishing in the traditional sense and publishing by "xerox".

Once it was decided to limit the investigation to monographs and to the contents of the *PolarPac2* database, several parameters had to be established. Which libraries' collections would be analyzed? Which subjects would be chosen for examination? Would language and date of publication be factors that would be interesting to explore? Once the criteria for analysis was established, what tools or methodology would be used?

Database Analysis Methodology

From the 32 libraries whose collections had holdings in the *PolarPac2* database, only five libraries were selected for analysis. All five of the libraries chosen were located in the United States. This decision was based upon the fact that the vast majority of database monographic holdings were in libraries of the U.S. and because it was desirable to see what the U.S. was holding in the area of polar monographic literature. As future progress in building a polar database is made, we will be able to analyze the database as a whole and by national strengths as well.

Other libraries from the United States had their monographic holdings in the *PolarPac* database, but the first edition of *PolarPac* had shown which libraries not only had major holdings in the area of polar literature, but more importantly which libraries held the most UNIQUE items (West, 1990). This was significant because the author was not interested so much in how much each library in the U.S. owned, but what the nature of polar literature was.

For the reasons outlined above, the following libraries were chosen for analysis: the Elmer E. Rasmuson Library, University of Alaska Fairbanks; the Alaska State Library, the Alaska Resources Library, U.S. Dept. of the Interior; Dartmouth College, Stefansson Collection; the Institute of Arctic and Alpine Research, University of Colorado Boulder; and, the Goldthwait Polar Library, Byrd Polar Research Center, Ohio State University.

The sizes of the five collections analyzed varied enormously from a high at the Rasmuson Library of 50,927 monographs to a low of 1,840 monographs at the Goldthwait Polar Library. The Goldthwait Polar Library was especially selected for its Antarctic orientation as opposed to Arctic which is the main emphasis of the other four libraries selected.

Once the libraries were selected, it was necessary to establish criteria against which the collections would be measured. There categories were chosen: subject of publication; language of publication; and date of publication.

The reason for the section of subjects as a criteria is self-evident. The subject categories chosen were those thought to be relevant to polar emphasis. For example, quantum mechanics was NOT selected since it, by definition, cannot have a polar orientation, but botany and all its divisions were selected for analysis. To keep this paper at a reasonable length, a detailed data analysis of each subject category will not be included. Only general overall subject data will be given. However, the outline of all subjects selected for which data was founded is given below.

Subjects Chosen for *PolarPac* Analysis
Agriculture
Anthropology
Art and Architecture

Biological Sciences
    Natural History
    Ecology
    Botany (General)
    Plant Ecology
    Alpine Flora
        Antarctic Regions
    Zoology (General)
        Antarctic Regions
        Antarctic Ocean

Biological Sciences (continued)
    Fishes
        Antarctic Regions
    Birds
        Antarctic Regions
    Mammals
        Antarctic Regions

Business and Economics
Chemistry
Computer Science
Education

Engineering and Technology
    Hydraulic Engineering
    Environmental Technology
    Building Construction
    Mining Engineering and Metallurgy
    Low Temperature
    Handicrafts, Arts and Crafts

Geography and Earth Sciences
    Geomorphology
    Hydrology
    Ice & Snow
    Oceanography
    Geophysics
    Meteorology
    Climatology
    Geology
    Sedimentation, etc.

History and Auxillary Sciences
Language, Linguistics, and Literature
Law
Library Science

Mathematics
Medicine
Music
Performing Arts
Philosophy and Religion
Physical Education and Recreation
Physical Sciences Astronomy Low Temperature Physics Optics, Light, Radiation Electricity, Magnetism, etc. Geomagnetism
Political Science Local Government Colonies & Colonization Military Science (General)
Psychology
Sociology

Monographs were analyzed according to the primary language of the text. If a monograph was bilingual, it was counted under the first language listed. Languages analyzed (in addition to English) were Russian, German, French, Danish, Eskimo, Norwegian, Swedish, Native American, Finnish, Dutch and all other languages.

Date of publication was also examined. In the case of reprints, the reprint date was the date selected for analysis. The date categories used were pre-1900; 1900 to 1950 broken by decade; and 1950 to 1989 broken by five-year increments. The more detailed breakdown was selected for post-1950 due to the increased interest in and increased publication on the polar regions since World War II.

WLN Conspectus Analysis Service

WLN, the vendor of *PolarPac*, also offers a conspectus analysis service. Conspectus is a national (U.S.) recognized method for assessing the strengths and weaknesses of collections. The WLN Conspectus software allows a library or group of libraries to create its own collection assessment database and print a variety of assessment reports.

WLN offers a subject-oriented approach derived from the RLG Conspectus. It offers 24 subject divisions which can be subdivided into 500 subject categories which can be further subdivided by approximately 4,000 descriptors. Each of the subject divisions related to range of Library of Congress classification numbers. In other words, the subject analysis itself rests upon the classification number given to the item being analyzed.

Other criteria can be used as well that can either be analyzed independently of subject or can be combined with subject to provide a more complex picture of subject strength.

Analysis Results

The database analyzed contained 105,679 holdings from the five U.S. libraries whose collections have major emphasis on the polar regions. The holdings of each library is given below in Table 1.

NUMBER OF HOLDINGS ANALYZED BY LIBRARY

University of Alaska Fairbanks	50,927
Alaska State Library	28,734
Alaska Resources Library	20,679
Institute of Arctic & Alpine Research	2,161
Dartmouth College Stefansson Collection	2,338
Goldthwait Library Byrd Polar Research Center	1,840

Table 1

Please note that the analysis did not de-duplicate the holdings. Thus, titles might be owned by each of the libraries analyzed resulting in five holdings. This is a holdings analysis, not a title analysis. Such a de-duplication of the polar conspectus database can be done to develop a picture of title distribution, but for the purposes of this paper, only holdings distributions will be examined.

Analysis Results--Subject

For the most part, there were few surprises in the subject analysis. (For a detailed listing of what is included in each subject, see the list above.) Experienced users of polar information will be unsurprised to discover that,by far, the greatest number of holdings were concentrated in the area of geography and earth sciences. 21,004 holdings were reported here which constitutes almost 20% of the database. Following geography/earth sciences, the next largest holding was history and auxiliary sciences which had 14,988 holdings of 14.2% of the database. Chart 1 shows a breakdown of the database by subject and what percentage each subject is of the total database holdings.

A very detailed spreadsheet analysis combining subject, library, and date of publication was done for each subject category. Unfortunately, the inclusion of these results would make this paper hundreds of pages long, so for the sake of brevity only the overall subject breakdown is given.

Analysis Results--Languages

As might be expected, since all libraries analyzed were located in the United States, the primary language of the current polar database is English which constituted 90.6% of the database or 95,790 holdings. Table 2 shows the number of holdings for each of the non-English languages.

HOLDINGS FOR NON-ENGLISH LANGUAGES

Russian	4,951
German	1,091
French	795
Danish	642
Eskimo	648
Norwegian	354
Swedish	330
Icelandic	187
Native American	107
Finnish	66
Dutch	61
Other	657

Table 2

Conspectus Analysis of Polar Monographs

All Subject Areas

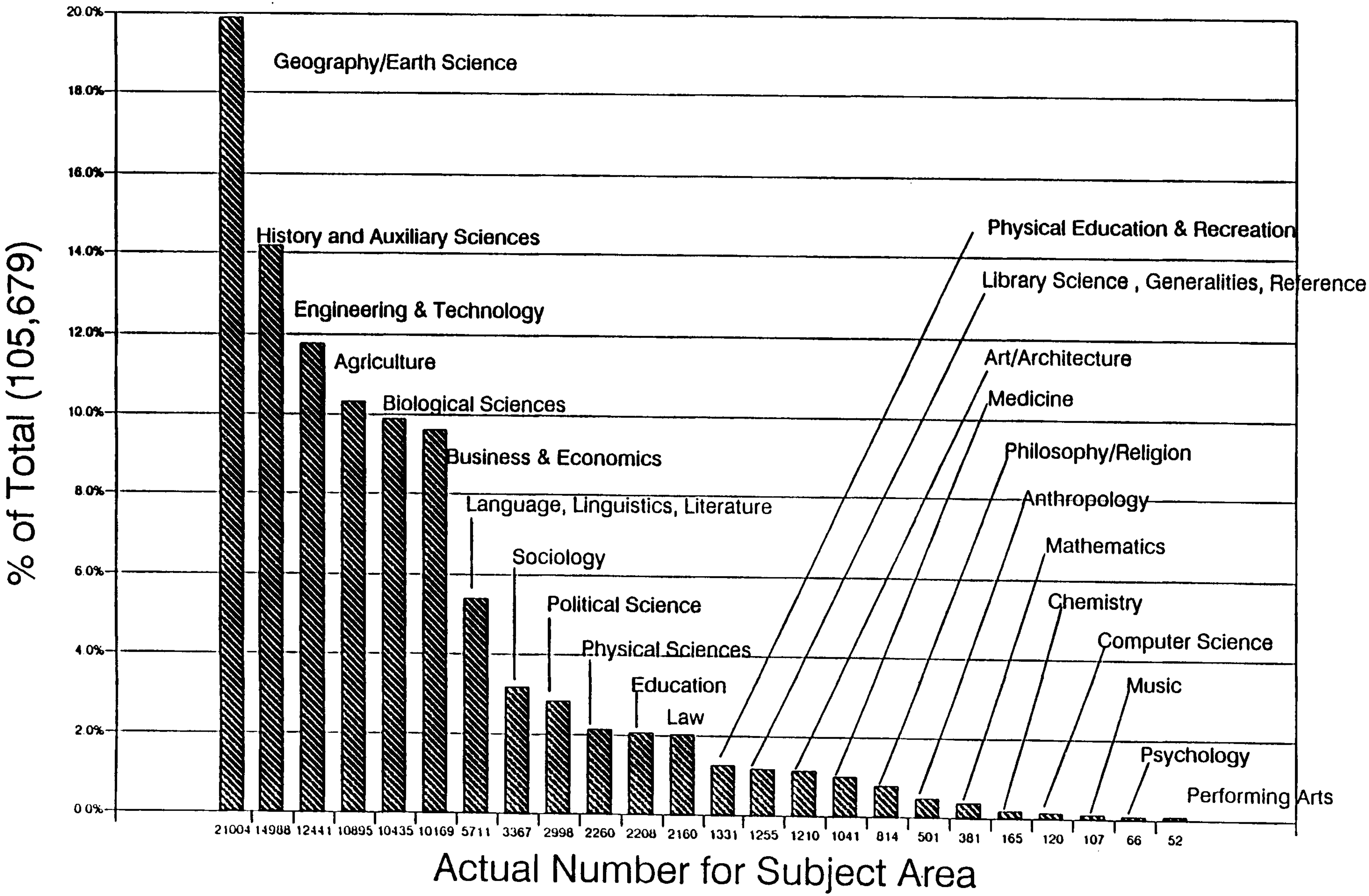


Chart 2 shows graphically how dominant the Russian language is in the database if English is not included in the analysis. The is not unexpected due to the large territorial presence Russia has in the Arctic.

What is more surprising is the few holdings in the Nordic languages. One might reasonably expect more holdings in Norwegian, Finnish, Danish, and Swedish. We know from the *PolarPac1* project that libraries of the Nordic countries submitted very large lists of serial titles and that these libraries might reasonably be expected to contain large numbers of monographic polar titles. We can only conclude from this result therefore that future development of the *PolarPac* database must pursue the inclusion of monographic collections of the Nordic libraries.

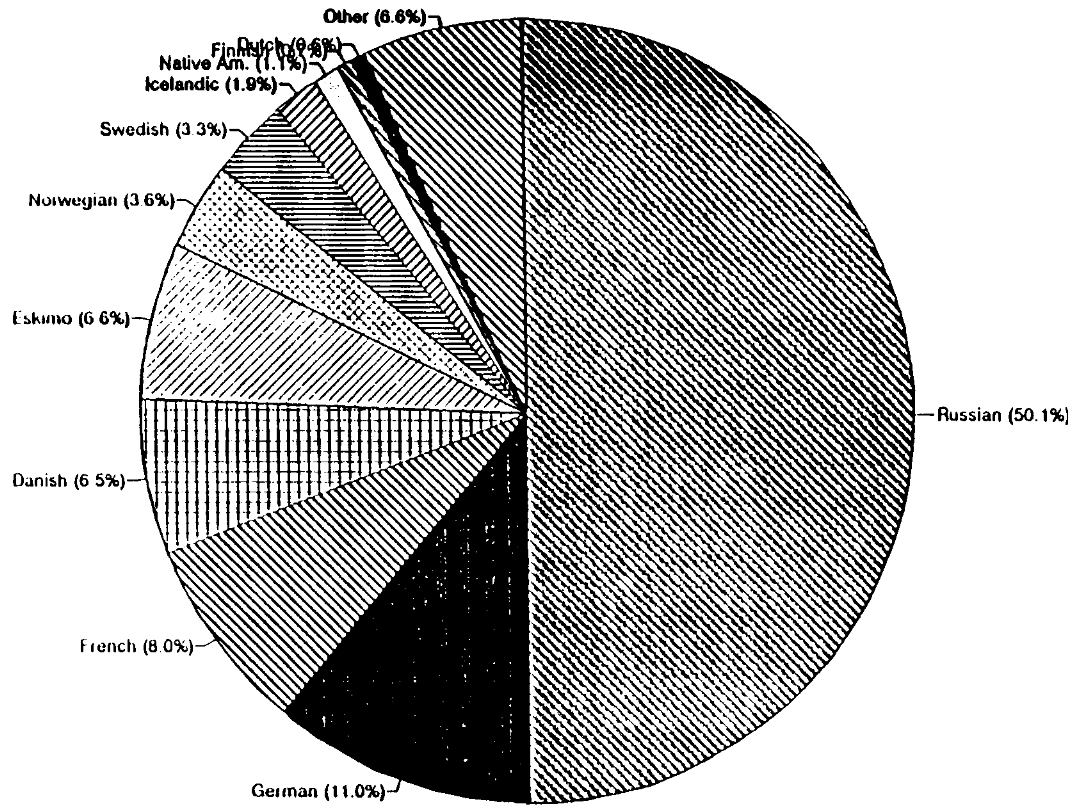
If we analyze the subjects covered by the Russian language titles (Chart 3), we find that the subject distribution follows, for the most part, the subject distribution found for the database as a whole. Geography and earth sciences has the heaviest emphasis, with history and auxiliary being second. The only variance is that the subject area of language is third in emphasis and constitutes 11.2% of the Russian holdings. For the overall database, language ranks seventh in emphasis and constitutes only 5.4% of the total database. This may reflect the presence of many language minorities in the Russian north and the Russian study of these minorities.

Analysis Results--Year of Publication

An analysis of publication date yielded some interesting facts. As might be expected the period following World War II showed a much greater rate of publication than prior to the war. This of course also mirrors the worldwide increased rate of publication in general for all subject and geographic areas. However, the extent that this is true was somewhat startling. Of all the holdings found in the database, 77.6% of them have been published from 1965-1989. (Although we have the data for 1990+, it was not used in analysis since it obviously does not constitute a 5-year period). This means, quite simply, that out of every 10 polar monographs, 7.7 of them have been published since 1965. Chart 4 shows the publication distribution for all holdings in *PolarPac*. While this pattern was not unexpected, the extent to which it is true is somewhat surprising.

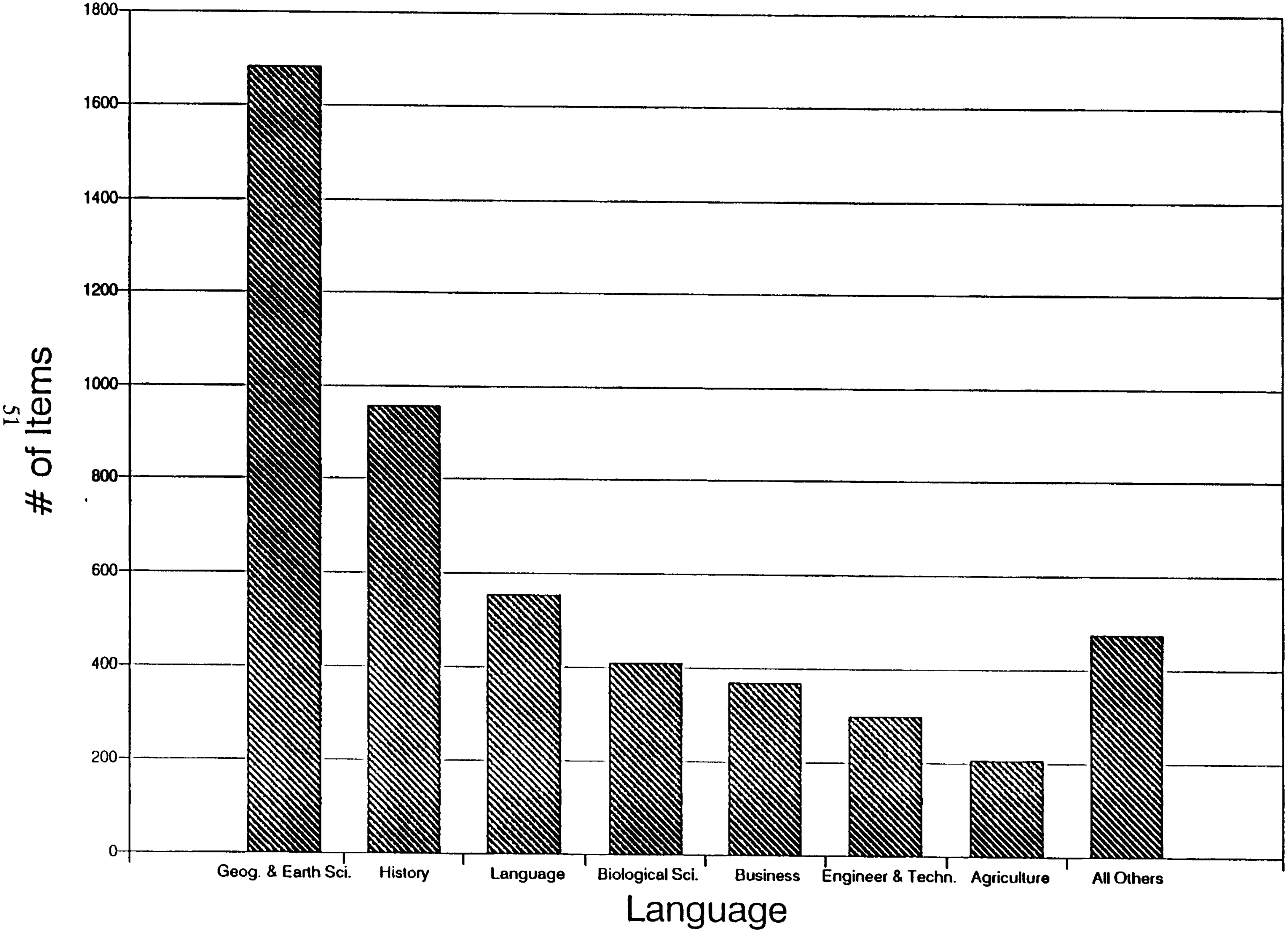
The fact that Chart 4 shows an increase in every five year period since 1950 is not unusual. Speculation might lead us to theorize as to what geo-political events of the various time periods would have lead to increased publication. 1920-1939 was a period in which many accounts of the Klondike and Nome Gold Rush were published. In 1959, Alaska was awarded statehood. In the 1970s, Alaska saw the passage of the Alaska Native Claims Settlement Act, the building of the Alaska Pipeline, and the passage of Alaska National Interest Lands Conservation Act. As a result of these laws and activities, there was an upsurge in the production of environmental impact statements (EIS) and monographs resulting from these EIS.

Analysis of Non-English Holdings

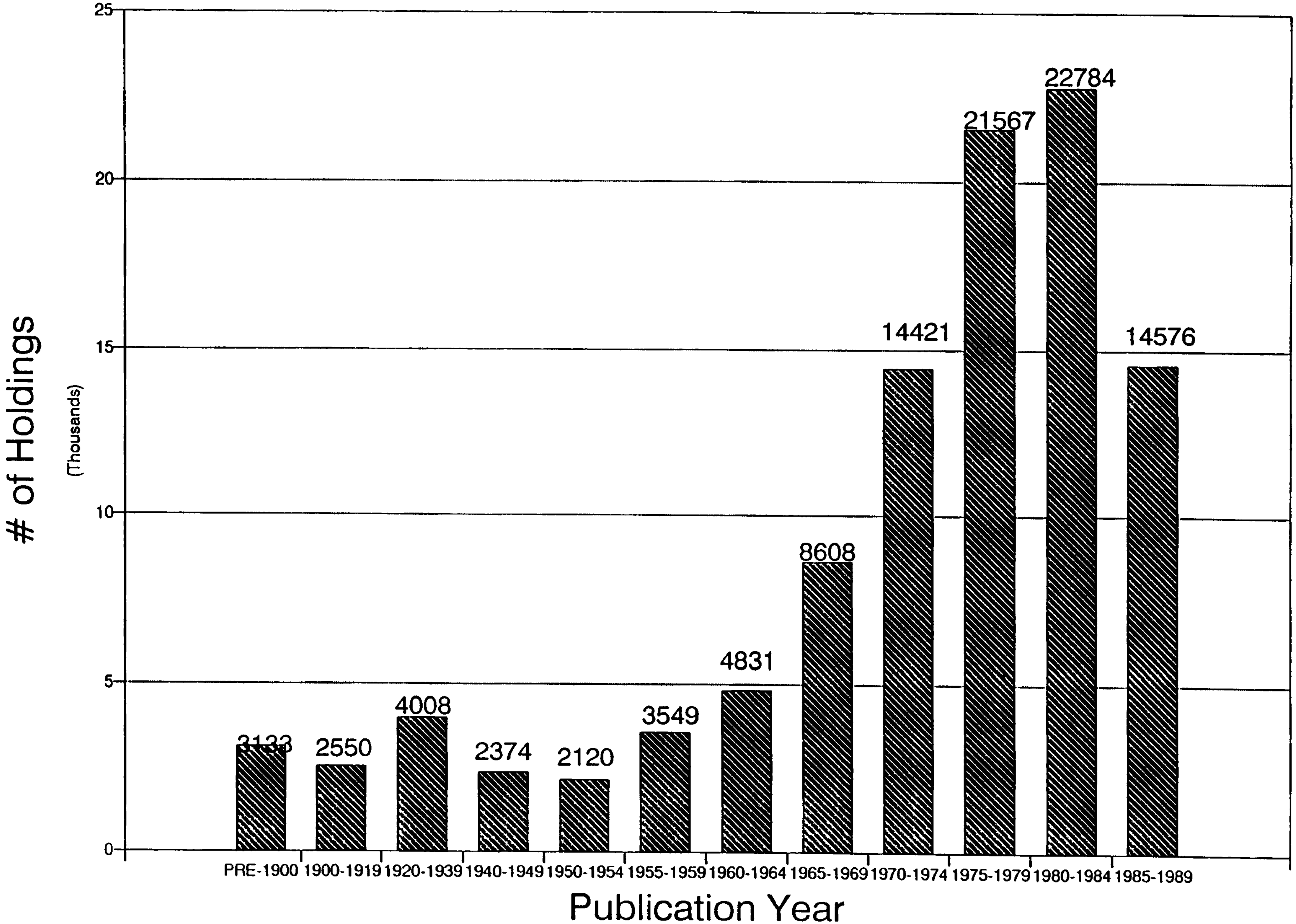


English = 94645 (91.0%)

Subject Analysis of Russian Holdings



Polar Holdings by Publication Year



What is perhaps the most unforeseen finding of all the publication date information is the rather dramatic drop in the number of holdings in the database for the five-year period 1985-1989. While 1980-84 constituted 21.6% of the database, 1985-1989, by contrast, only constituted 13.8% of the database. Table 3 gives the breakdown by library in combination with publication year. To read the table, note that the following abbreviations are used: Ak = Alaska State Library, AkAAR = Alaska Resources Library; AkU = Elmer E. Rasmuson Library, University of Alaska Fairbanks; CoU-IA = University of Colorado, Institute of Arctic and Alpine Research Library; NhD-S = Dartmouth College, Stefansson Collection; OU-BP = Goldthwait Polar Library, Byrd Polar Research Center, Ohio State University.

Why would this be so? All libraries analyzed showed a drop in acquisition during this time period. One possible explanation might be the drop in oil prices in 1984. In Alaska, this drop had a catastrophic effect on library budgets. One might hypothesize that libraries were buying less due to lack of funds for acquisitions. At the same time, the perception is that funding of state and federal publication began dropping due to austerity measures. This may have lead to actually fewer publications being available to libraries. Investigations into the reasons for the drop in acquisition rates into the 1990s also need to be investigated to see if this is a continuing trend. The question to be answered is this: Is there a drop in publication on polar regions in the monographic literature, or, are the U.S. polar libraries not acquiring materials at the rate at which they are being published?

Conclusions

While the data retrieved for this project was limited to monographic holdings of U.S. libraries, it has given us a fascinating snapshot of polar literature. As we continue to analyze the interaction between subject, language, and date of publication, we will gain a deeper understanding of what is published, where it is being published, and if there are shifts in the publication patterns with time within subjects. At times, in looking at the data, the author has felt that there might be more data that we can understand. There is also the danger the we might over-extrapolate from what is, after all, a relatively small database.

As holdings from other libraries are added, especially for those libraries whose primary language is not English, the picture we receive will change. This analysis has given us a foundation upon which to build an ever growing understanding of what we mean when we say "polar literature."

Polar Holdings Analysis by Publication Year

	PRE-1900	1900-1919	1920-1939	1940-1949	1950-1954	1955-1959	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-	OTHER	TOTALS
Totals	3133	2550	4008	2374	2120	3549	4831	8606	14421	21567	22784	14578	498	560	105579
% of Database	3.0%	2.4%	3.8%	2.2%	2.0%	3.4%	4.6%	8.2%	13.7%	20.4%	21.6%	13.8%	0.5%	0.5%	
Ak	914	691	959	588	511	844	1035	1955	3606	5799	6583	4908	284	59	28734
% of Period's Holdings	29.2%	27.1%	23.9%	24.8%	24.1%	23.8%	21.4%	22.7%	25.0%	26.9%	28.9%	33.7%	57.0%	10.5%	27.2%
% of Library's Holdings	3.2%	2.4%	3.3%	2.0%	1.8%	2.9%	3.6%	6.8%	12.5%	20.2%	22.9%	17.1%	1.0%	0.2%	
AkAAR	52	106	173	151	192	305	583	1126	2829	5418	5828	3852	52	12	20679
% of Period's Holdings	1.7%	4.2%	4.3%	6.4%	8.1%	8.6%	12.1%	13.1%	19.6%	25.1%	25.6%	26.4%	10.4%	2.1%	19.6%
% of Library's Holdings	0.3%	0.5%	0.8%	0.7%	0.9%	1.5%	2.8%	5.4%	13.7%	26.2%	28.2%	18.6%	0.3%	0.1%	
AkU	1468	1420	2340	1510	1266	2148	2891	5043	7395	9793	9817	5445	160	231	50927
% of Period's Holdings	46.9%	55.7%	58.4%	63.6%	59.7%	60.5%	59.8%	58.6%	51.3%	45.4%	43.1%	37.4%	32.1%	41.3%	48.2%
% of Library's Holdings	2.9%	2.8%	4.6%	3.0%	2.5%	4.2%	5.7%	9.9%	14.5%	19.2%	19.3%	10.7%	0.3%	0.5%	
CoU-IA	46	94	194	111	75	130	213	284	365	285	215	148		3	2161
% of Period's Holdings	1.5%	3.7%	4.8%	4.7%	3.5%	3.7%	4.4%	3.3%	2.5%	1.3%	0.9%	1.0%	0.0%	0.5%	2.0%
% of Library's Holdings	2.1%	4.3%	9.0%	5.1%	3.5%	6.0%	9.9%	13.1%	16.9%	13.2%	9.9%	6.8%	0.0%	0.1%	
NhD-S	603	212	260	74	41	52	30	17	7	8	19	12		3	1338
% of Period's Holdings	19.2%	8.3%	6.5%	3.1%	1.9%	1.5%	0.6%	0.2%	0.0%	0.0%	0.1%	0.1%	0.0%	0.5%	1.3%
% of Library's Holdings	45.1%	15.8%	18.4%	5.5%	3.1%	3.9%	2.2%	1.3%	0.5%	0.6%	1.4%	0.9%	0.0%	0.2%	
OU-BP	50	25	82	40	35	70	79	183	219	264	324	218	2	252	1840
% of Period's Holdings	1.6%	1.0%	2.0%	1.7%	1.7%	2.0%	1.6%	2.1%	1.5%	1.2%	1.4%	1.5%	0.4%	45.0%	1.7%
% of Library's Holdings	2.7%	1.4%	4.5%	2.2%	1.9%	3.8%	4.3%	9.9%	11.9%	14.3%	17.6%	11.7%	0.1%	13.7%	

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CONTRASTS IN COVERAGE: AN EXAMINATION OF THE POLAR BIBLIOGRAPHIC DATA BASES ON THE NISC ARCTIC AND ANTARCTIC REGIONS CD-ROM

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Abstract

With the launch of the NISC *Arctic and Antarctic Regions* CD-ROM, the polar community has been confronted with an apparent profusion of polar bibliographic databases. This paper compares and contrasts geographic and subject coverage of the various databases, suggesting that when examined in detail, they are considerably less alike than a more cursory inspection might suggest.

Introduction and Methodology

This paper reports analyses conducted on the March 1991 release of the *Arctic and Antarctic Regions* CD-ROM. This release contains data submitted by the various database producers up until circa December 1990 and excludes *BOREAL* and *BOREAL NORTHERN TITLES* databases (producer: Canadian Circumpolar Library) which will be both available on the forthcoming NISC release. The databases studied are *ASTIS* (producer: Arctic Institute of North America), *C-CORE* (producer: Cold Ocean Resources Engineering Center), *COLD REGIONS - ANTARCTIC BIBLIOGRAPHY*, *COLD REGIONS - COMMON RECORDS*, and *COLD REGIONS - CRREL* (producer: Cold Regions Bibliography Project), *SPRI* (producer: Scott Polar Research Institute), and WDC-A (producer: World Data Center A for Glaciology).

Performing comparative analyses on bibliographic databases is notoriously more difficult than superficial appearances might suggest. The analyses reported by this paper are based on the number of records relating to particular subjects or regions as identified by running standard searches using the NISC global search option. In studying the results obtained, the reader should bear in mind that these are not uninfluenced by the abstracting and indexing policies of the individual databases. Thus, for example, number of records retrieved from any database will tend to increase with the average length of abstract in that database. Similarly, more records will tend to be found where a database has a policy of detailed rather than brief indexing. Another point to bear in mind is the tendency for such searchers as those reported below to underestimate the strength of coverage for 'core' database topics. For polar databases, the easiest way to illustrate this is to enter the term

'ANTARCT' as a search term on *COLD REGIONS: ANTARCTIC BIBLIOGRAPHY* (henceforth *ANTARCTIC BIBLIOGRAPHY*). 26,426 items will be retrieved having this term in the title, abstract, or various indexing fields. Since the remaining 9,920 items in this database must also surely relate to Antarctica, this search has effectively underestimated the relevant holdings of the databases by 27% (9,920 out of the database total of 36,346). This problem can be quite simply overcome in the case of the *ANTARCTIC BIBLIOGRAPHY* and *COLD REGIONS: COMMON RECORDS* (henceforth *COLD - COMMON RECORDS*) databases since it can be assumed that ALL records should be retrieved on a search for items of Antarctic relevance. The problem, however, is not always so easily dealt with and it is difficult, for example, to be sure how greatly the coverage of the *COLD REGIONS: CRREL* (henceforth *CRREL*) and *C-CORE* databases has been under-estimated for subjects such as engineering and ocean sciences respectively. Finally, none of the reported analyses take into account duplication between databases. Identification of duplicates using the present NISC user interface is time consuming and did not prove feasible on the scale desirable for this paper. However, Fred Dürr (NISC) has informed me that he has now developed procedures enabling him to identify the extent of database duplication and that the overall rate of duplication is surprisingly low with possibly over 75% of all records unique to one database (personal communication).

Contrasts in Time Period Covered

The seven polar databases differ considerably as to date of initiation, proportion of older material included through retrospective conversion programmes, and extent to which they have been able to maintain a relatively constant output over the period studied. Table 1 gives an overview of the number of records contributed for all publication years between 1970 and 1989.

Table 1: Overview of records contributed 1970-89

	Total '70-89	Av. '70-89	Highest '70-89	Lowest '70-89	Total '85-89
ASTIS	32668	1633	3605 ('83)	101 ('70)	5084
C-CORE	21774	1089	1693 ('79)	392 ('70)	5463
ANT.BIB.	25984	1299	1078 ('76)	1564 ('88)	7519
COLD.JT.	6498	325	505 ('85)	26 ('70)	2065
CRREL	75780	3789	4083 ('85)	3311 ('89)	19000
SPRI		34181	1709	5369 ('88)	187
('74)	24660				
WDC-A	23733	1187	1857 ('86)	322 ('72)	7542

Taking the period as a whole, *CRREL* is substantially the largest contributor, inputting 75,780 records at an average of 3789 for each year of publication with a maximum of 4083 for 1985. *SPRI* (34,181) ranks narrowly second ahead of *ASTIS* (32,668) but the similarity in size masks a much greater disparity of content between these two databases, with the bulk of *SPRI* entries contributed for the years from 1984 on, and those for *ASTIS* between 1977-84.

The number of records for each publication year in *CRREL* has shown a remarkable degree of consistency back to the late 1960's. This consistency suggests the question: has the output of relevant publications remained constant or has *CRREL* become increasingly selective in its inclusion of more recent literature because of the failure of resources to keep pace with research output? Judged by the experience of other research areas, the latter answer appears more likely. This same question also applies to other polar databases most of which have maintained relatively unchanging level of entries. *SPRI*, for example, appears an exception only because its database is the most recently established (1985). Figures 1a and 1b show the position for 1970's publications. Figures 2a and 2b show the position for 1980's publications.

Up until 1984, *CRREL* was the largest single contributor of records per publication year. After this date, the largest contributor has been *SPRI*, though when taken together the three *COLD REGIONS* databases remain the most substantial contributor. In the following analyses, all subject and geographic searches have first been matched against the entire contents of the NISC CD-ROM without any date qualification, and then for items published between 1985 and 1990 only. The results frequently differ considerably.

Contrasts in Geographic Coverage

To investigate geographical coverage, identical searches were run using the NISC global search option to obtain comparative estimates of the number of records in each database relating to Antarctica, Alaska, Canada, Greenland, Scandinavia and Russia. Overall results are summarised in Table 2 and Figures 3a and 3b. Details of individual database coverage and search strategies used are given in figures 4-9. Readers should again bear in mind the limitations of the techniques employed. There is no presumption that these searches have succeeded in identifying <u>all</u> the relevant entries in each database. It is also certainly true that in some cases irrelevant material will have been retrieved. For example, the search GREENLAND will have identified items relating to the Greenland Sea as well as to Greenland itself. The objective, however, is to produce comparative estimates of the quantity of material relating to each area and for this, despite the limitations, such techniques will suffice.

In total 126,250 records were retrieved by a series of searches intended to exhaust the polar geographical regions. Since there is a total of 282,114 records on Arctic and Antarctic Regions, at least 155,864 (55.25%) of these include none of the geographic search items used. To a large degree, this may reflect the quantity of 'pure' research on topics such as glaciology, cold weather engineering, etc., but it does also raise the question as to whether all records are as adequately indexed geographically as they might be, bearing in mind that depth of geographical indexing is, or should be, a particular strength of polar as opposed to discipline-oriented databases such as INSPEC, COMPENDEX, CHEMICAL ABSTRACTS, etc.

Table 2: Overall coverage

	Total	%	Total '85-'90	%
Antarctica	57361	45.23	16149	44.26
Alaska	12699	10.01	2947	8.08
Canada	26972	21.27	7276	19.94
Greenland	7099	5.60	2627	7.20
Scandinavia	9657	7.54	4523	12.40
Russia	13123	10.35	2962	8.12
Total items retrieved by geog. searches	126250		36484	

Overall figures show a 55/45 split between Arctic and Antarctic, with Canada the best represented Arctic region. The omission from the NISC disc of the *BIBLIOGRAPHY OF ALASKA AND POLAR REGIONS* (producer: Elmer E. Rasmuson Library) is reflected in the comparatively poor coverage of Alaskan material. Had an analysis been carried out for the period 1977 to 1984, it is likely that *ASTIS*'s exceptional coverage of Canadian literature during that period would have been very apparent. The inclusion of *BOREAL* and *BOREAL NORTHERN TITLES* will benefit Arctic coverage in general and Canadian coverage in particular. Despite these contributions, Canadian coverage of Arctic literature will remain far from complete prior to implementation of the long and eagerly anticipated Canadian Polar Information System. Once this is in place, the major lacunae will be Russia, Greenland and the Scandinavian countries for which *SPRI* currently provides the majority of material but there is much which *SPRI* does not include at present. The presence of bibliographic databases from these countries would provide a great boon to the NISC disc.

Contrasts in Subject Coverage

Subject coverage was studied in a similar way to geographic coverage by running identical searches using the NISC global search option. The object was to obtain estimates for database coverage of the following broad subject areas: engineering and related fields, social studies, life sciences, ocean sciences, atmospheric sciences, earth sciences and glaciology. The overall results are displayed in Table 3 and Figures 10a and 10b, whilst figures 11-17 give details of search strategies used and illustrate the coverage of each database. Designing appropriate search strategies was more difficult than for the geographical comparison and there is no suggestion that the numbers of records identified provide anything other than comparative figures and very rough estimates of total numbers involved.

Table 3: Overall subject coverage

	Total	%	Total '85-	%
Atmospheric sci.	36837	9.71	11946	10.60
Earth Science	53303	14.05	14923	13.25
Engineering	31443	8.29	8165	7.25
Glaciology	155579	41.01	44140	39.18
Life sci.	33789	8.91	11158	9.90
Ocean sci.	35577	9.38	12603	11.19
Social studies	32802	8.65	9733	8.64
Total items retrieved by subject searches	379330		112668	

The proportional dominance of glaciology (broadly defined) is apparent in this analysis but may well be over-stated since there are indications that the degree of duplication is likely to be greater in this area than in any other. (Many WDC-A entries are, for example, produced by editing of *COLD REGIONS* glaciological entries). Given that glaciological literature is not particularly well-covered by the discipline-oriented databases and split between *CHEMICAL ABSTRACTS, INSPEC, GEOREF, GEOBASE, GEOARCHIVE*, etc., the strength of the NISC disc in this area is a major potential selling point and one which should perhaps be reflected in the disc's title. Given the difficulty of constructing searches guaranteed to identify the bulk of material relating to broad subject categories, there is probably little to be gained from further analysis of overall subject statistics.

With regard to the breakdown of subject coverage by database, although tempting to myself as Librarian of the organisation responsible for the *SPRI* database, what cannot as yet be concluded is that for a significant range of subjects in the Arctic, the only substantive current coverage is that provided by *SPRI*. For the social sciences for the years 1985-90, for example, an analysis limited to the NISC disc would find that 88.6% of Russian material is to be found on *SPRI*, 86.2% of Scandinavian material and 77.9% of Greenland material. Similarly high percentages would be obtained for the life sciences, and percentages only slightly lower for atmospheric and ocean sciences. These figures would be significantly lowered by the inclusion within the analysis of *BOREAL* and *BIBLIOGRAPHY OF ALASKA AND POLAR REGIONS* and it is much to be hoped that such an analysis will soon prove possible.

Conclusion

This paper has reported preliminary investigations into comparative subject and geographic content of the bibliographic databases loaded on the most recent release of the NISC CD-ROM Arctic and Antarctic Regions. A similar analysis run against the forthcoming release will have the advantage of being able to include the important databases produced by the Canadian Circumpolar Library. If available as part of the new NISC user interface, the procedures developed by Fred Dürr for the identification of the extent of database duplication will open up whole areas of research with particularly important implications for database producers. Most previous initiatives have focused on the need to reduce duplication of effort through the shared use of catalogued records. My suspicion - backed up by Fred Dürr's findings on the limited extent of duplication on the NISC databases -is that we may find that our major problem is not one of excessive duplication of coverage but of extensive non-coverage. If so, further studies of this kind will be needed to indicate more exactly where present coverage is weakest.

Fig. 1a

1970s: Total no. of records from contributing databases

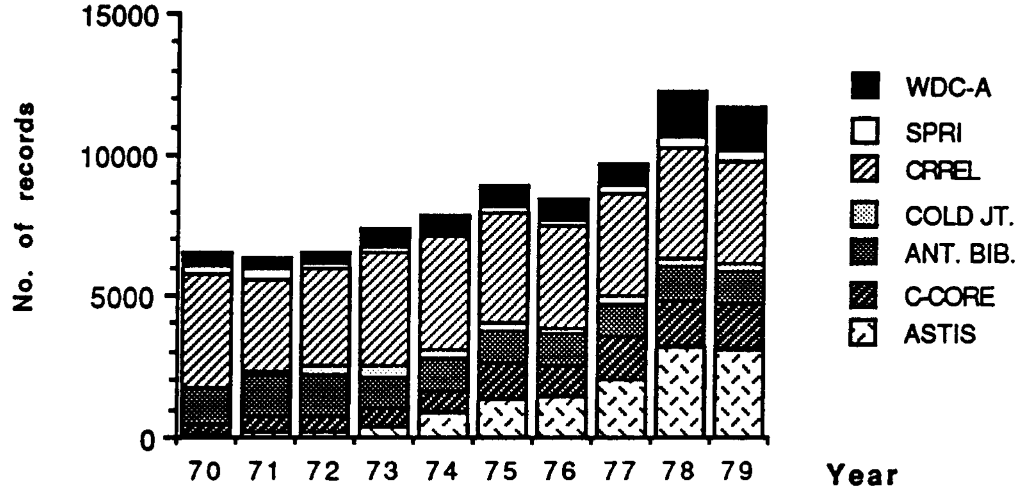


Fig. 1b

1970s: No. of records per database

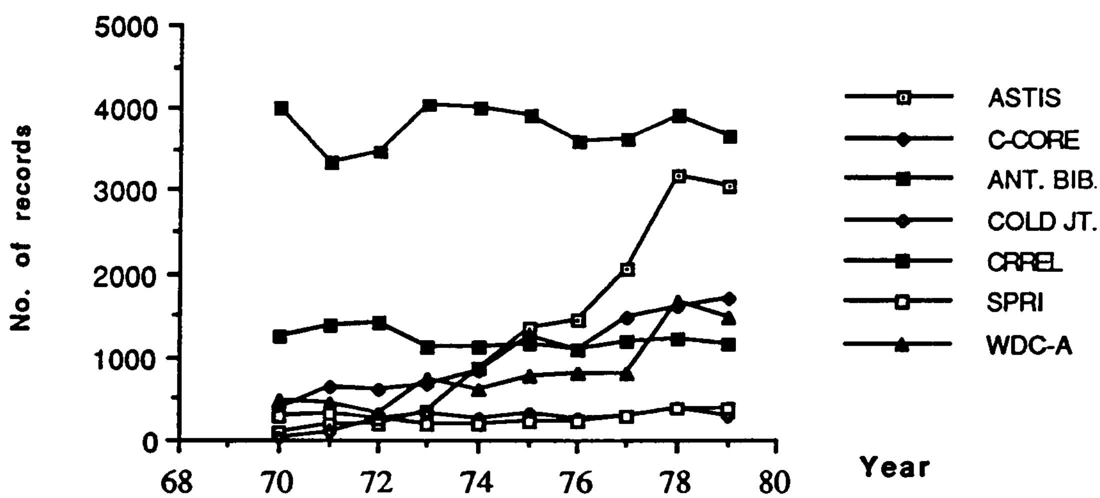


Fig. 2a

1980s: Total no. of records from contributing databases

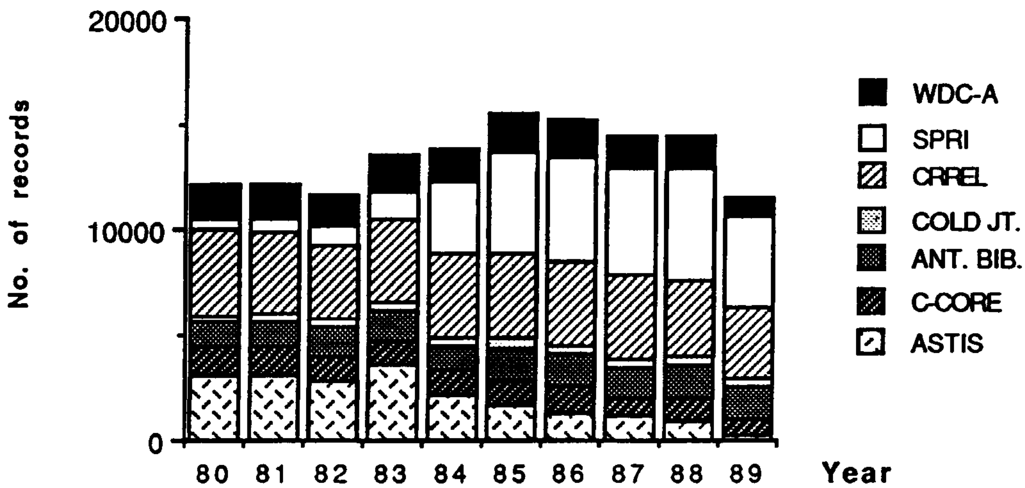


Fig. 2b

1980s: No. of records per database

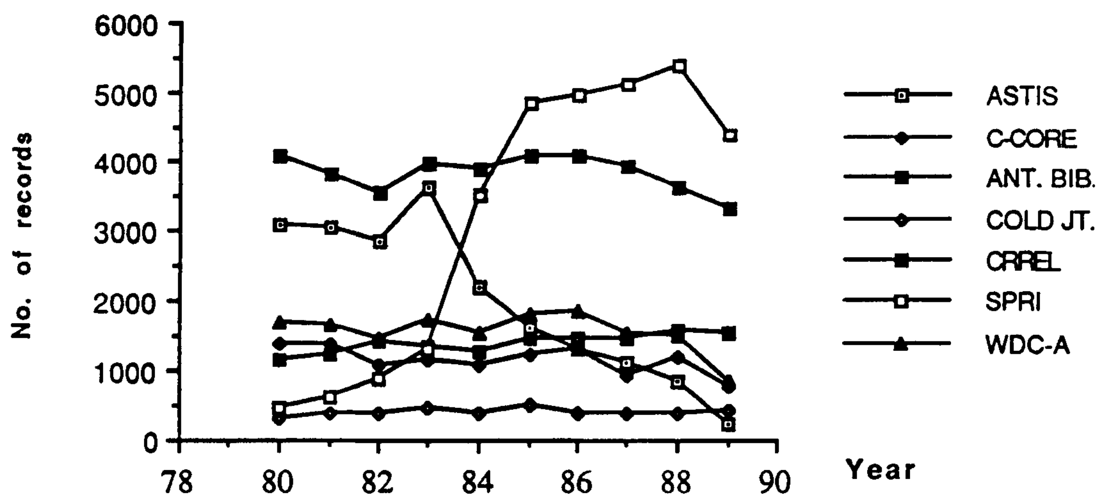


Fig. 3a

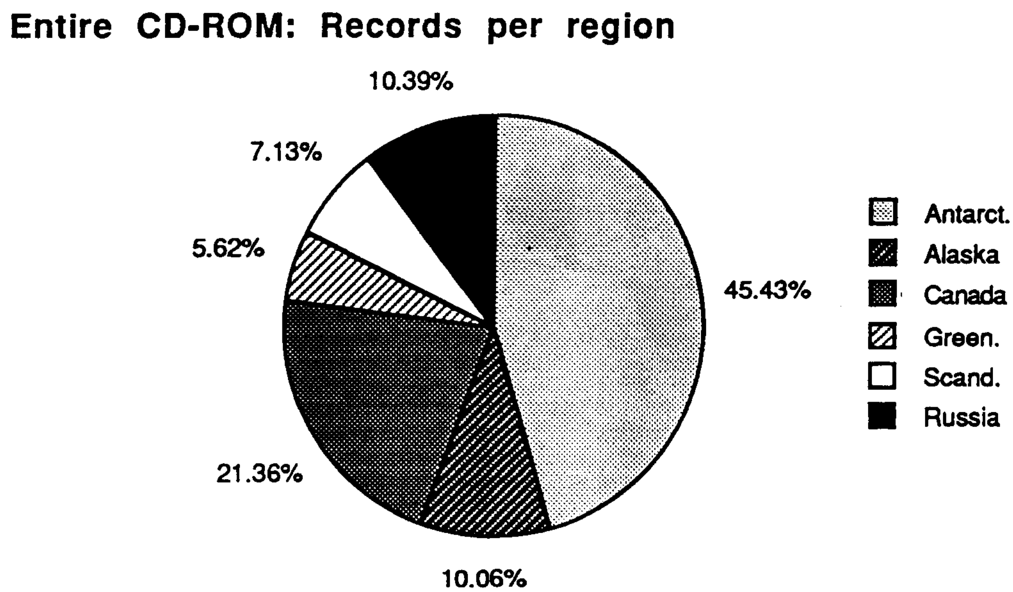

Entire CD-ROM: Records per region
10.39%
7.13%
5.62%
45.43%
21.36%
10.06%
Antarct.
Alaska
Canada
Green.
Scand.
Russia

Fig. 3b

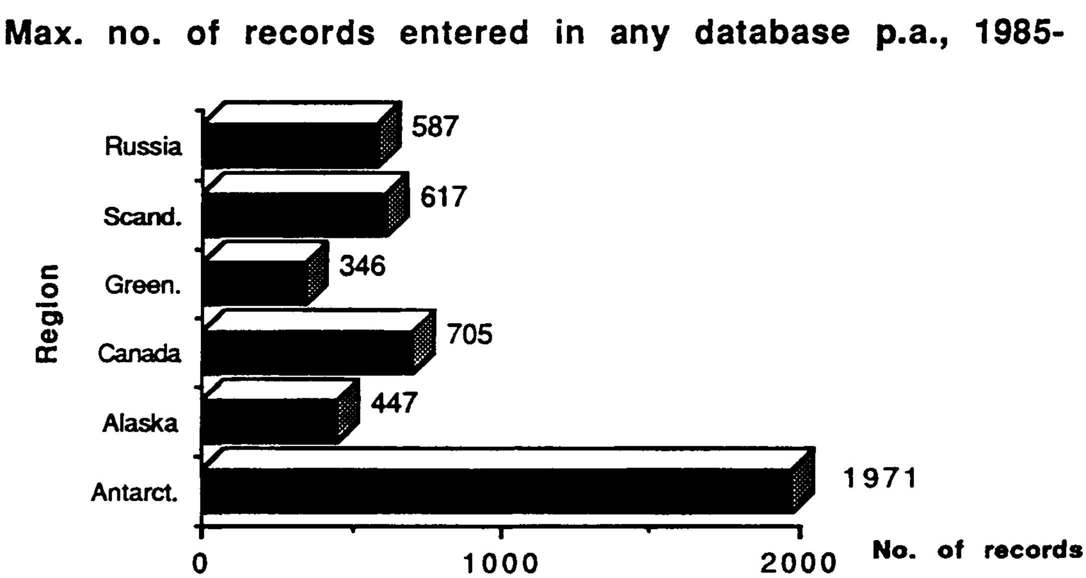
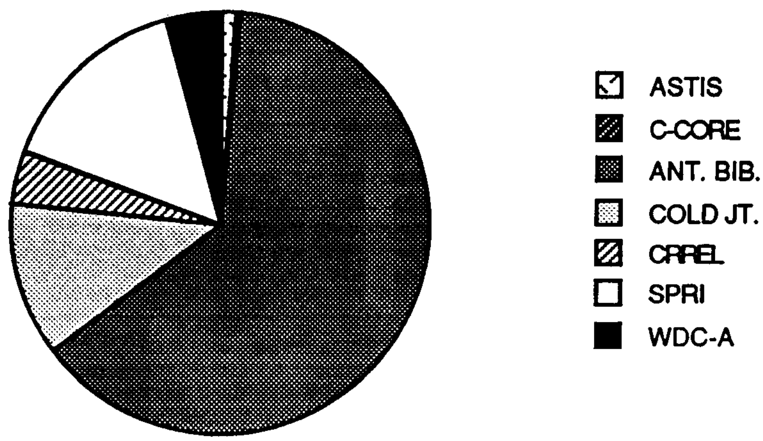

Max. no. of records entered in any database p.a., 1985-
Region
Russia
587
Scand.
617
Green.
346
Canada
705
Alaska
447
Antarct.
1971
0
1000
2000
No. of records

Fig. 4a

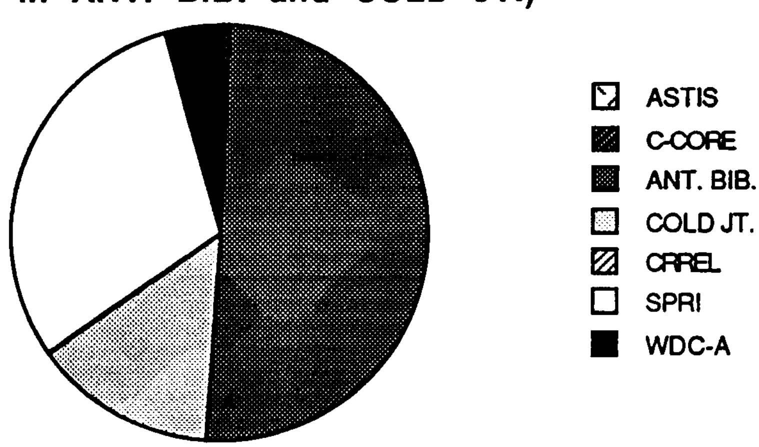
Entire CD-ROM: ANTARCT*
(incl. all items in ANT. BIB. and COLD JT.)



No. of records: 57,361

Fig. 4b

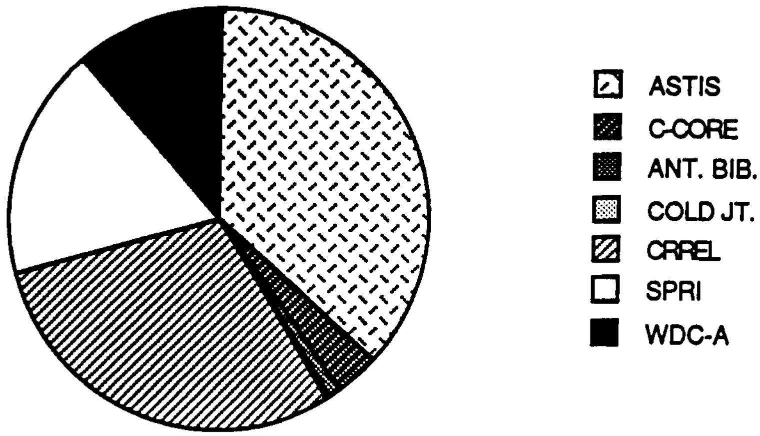
1985-90: ANTARCT*
(incl. all items in ANT. BIB. and COLD JT.)



No. of records: 15,339

Fig. 5a

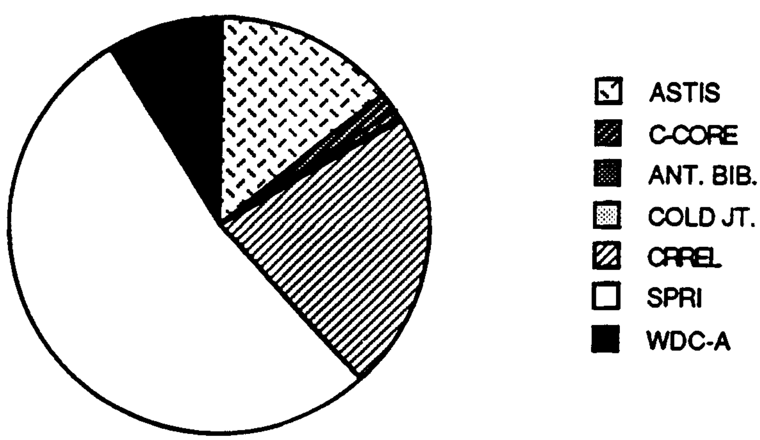
Entire CD-ROM:
ALASKA*



No. of records: 12,699

Fig. 5b

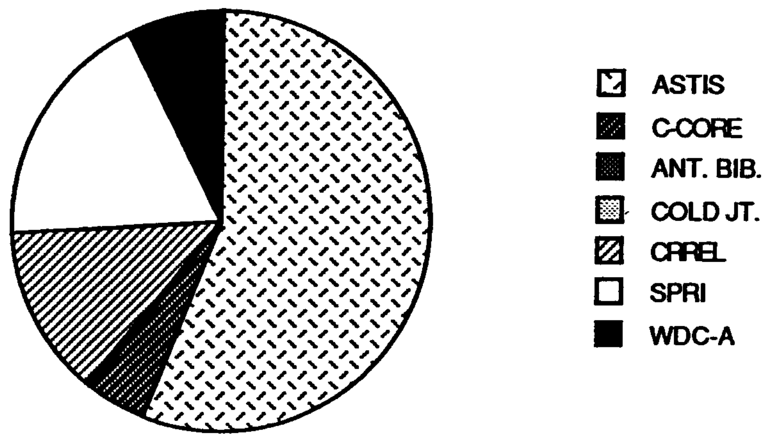
1985-90:
ALASKA*



No. of records: 2,947

Fig. 6a

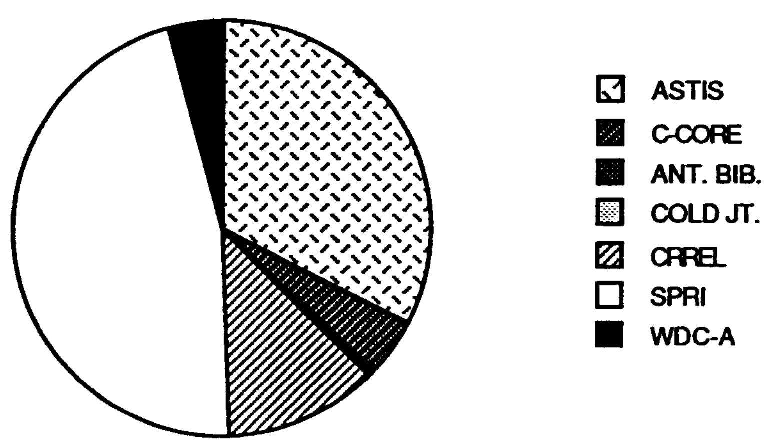
Entire CD-ROM:
CANAD*



No. of records: 26,972

Fig. 6b

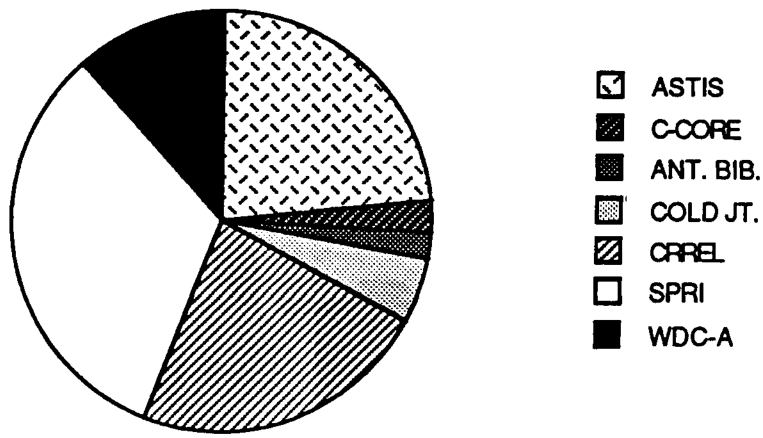
1985-90:
CANAD*



No. of records: 7,276

Fig. 7a

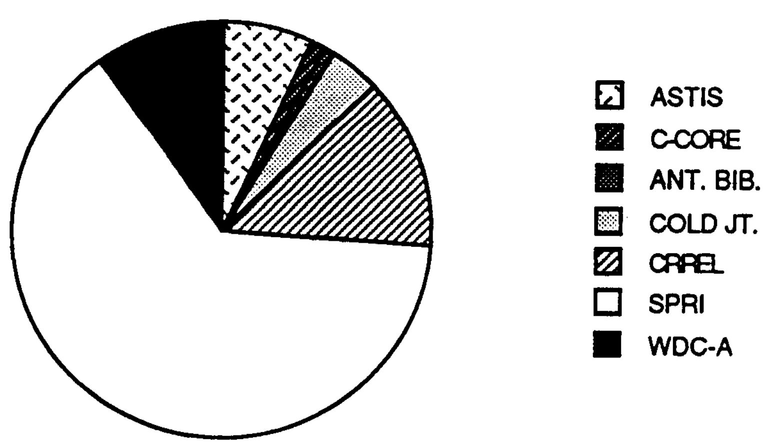
**Entire CD-ROM:
GREENLAND***



No. of records: 7,099

Fig. 7b

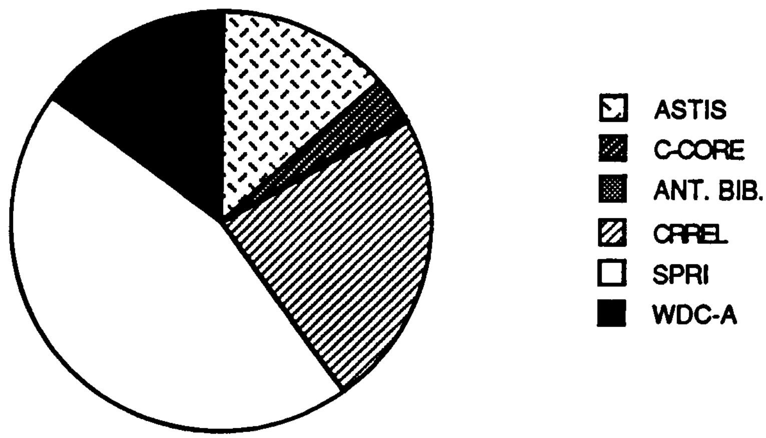
**1985-90:
GREENLAND***



No. of records: 2,627

Fig. 8a

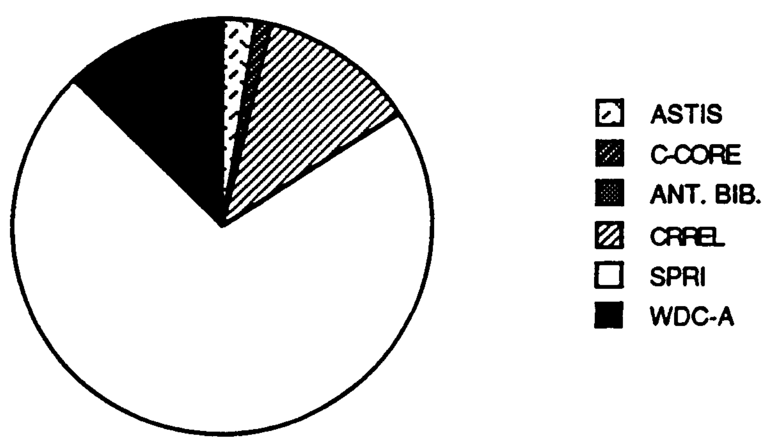
Entire CD-ROM: SCANDINAVIA* OR ICELAND* OR NORWAY OR SWEDEN OR FINLAND OR SVALBARD etc.



No. of records: 8996

Fig. 8b

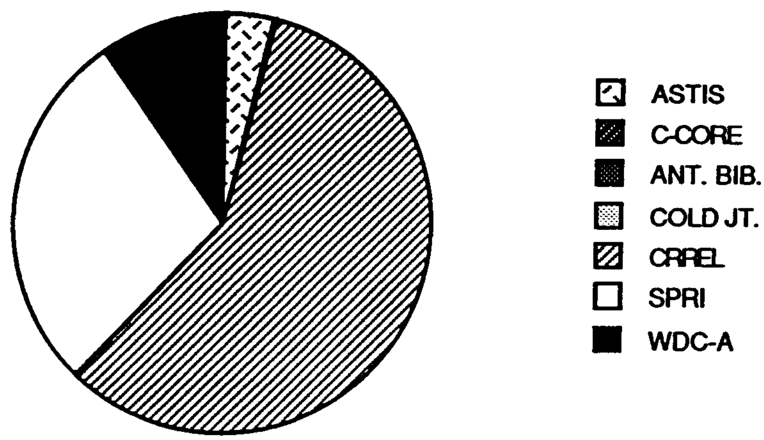
1985-90: SCANDINAVIA* OR ICELAND* OR NORWAY OR SWEDEN OR FINLAND OR SVALBARD etc.



No. of records: 4290

Fig. 9a

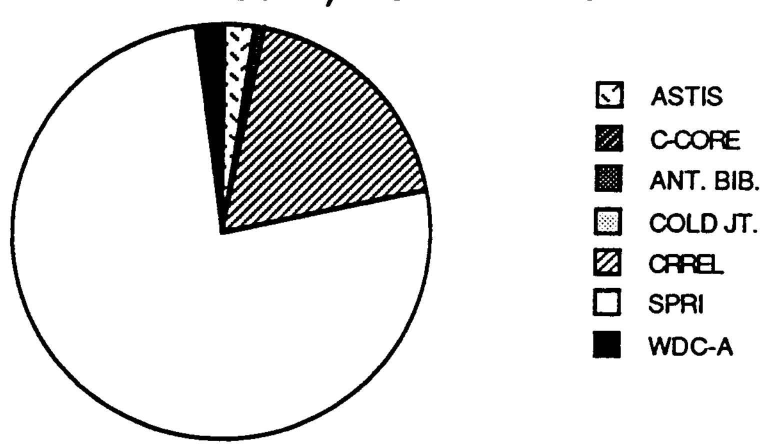
Entire CD-ROM:
(SOVIET* OR USSR OR RUSSIA*) NOT ANTARCT*



No. of records: 13,123

Fig. 9b

1985-90:
(SOVIET* OR USSR OR RUSSIA*) NOT ANTARCT*



No. of records: 2,962

Fig. 10a

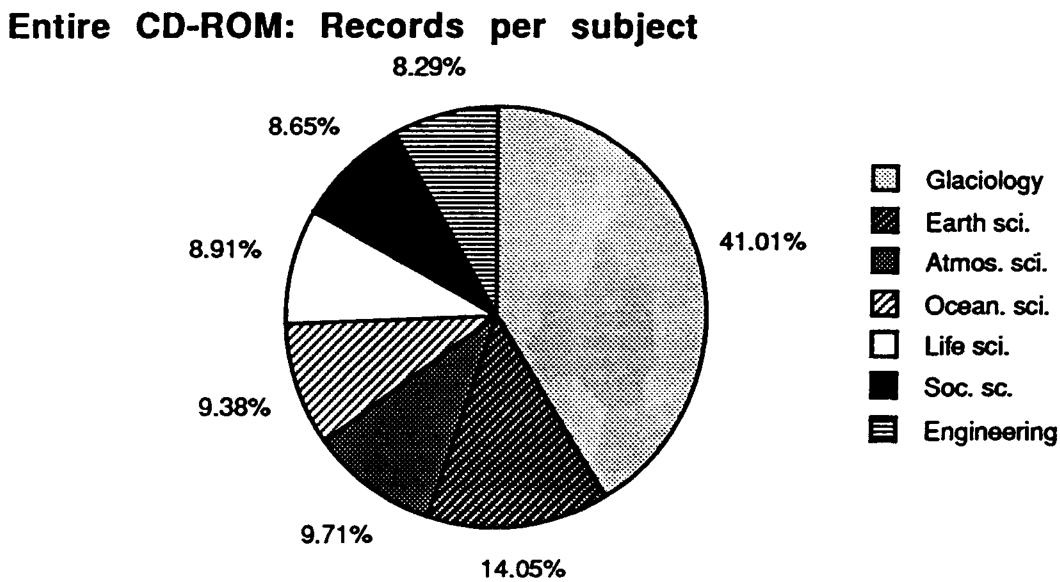


Fig. 10b

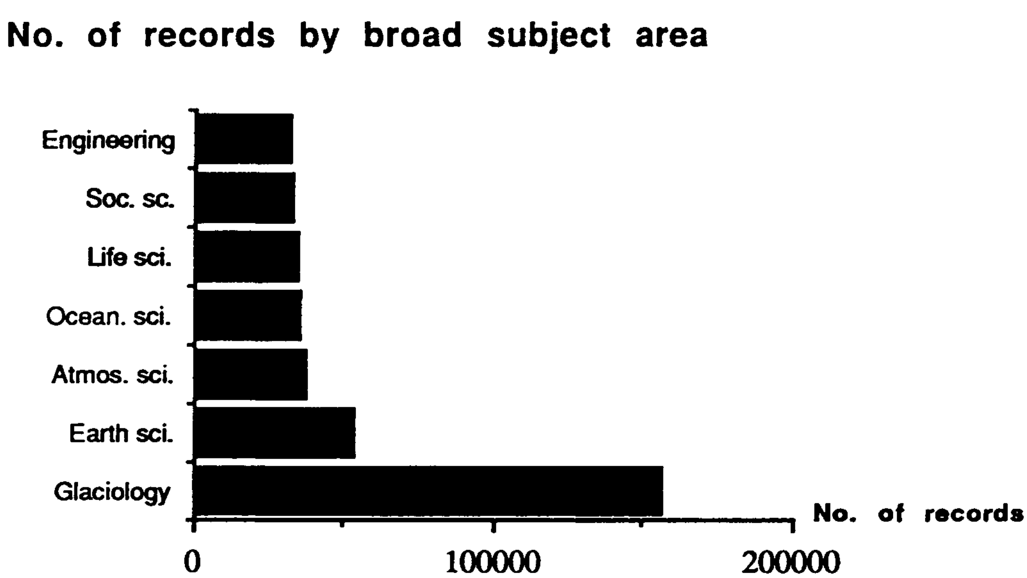
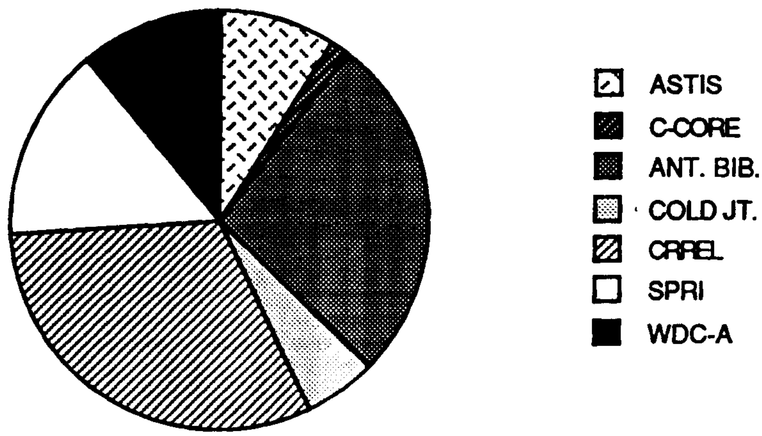


Fig. 11a

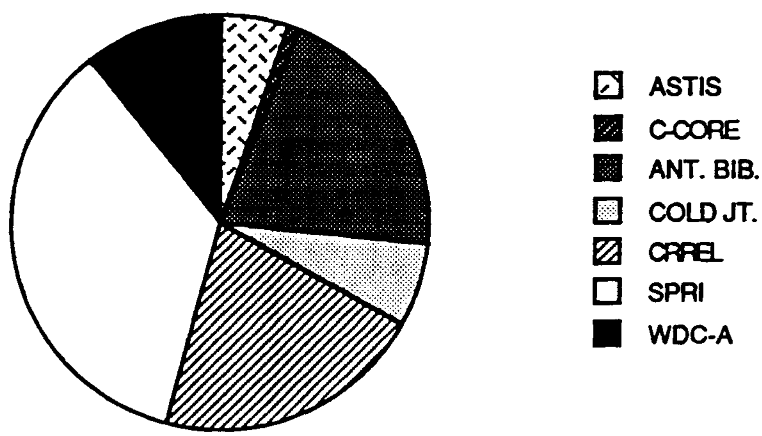
Entire CD-ROM: ATMOSPHER* OR CLIMAT* OR OZON* OR METEOROL*



No. of records: 36,837

Fig. 11b

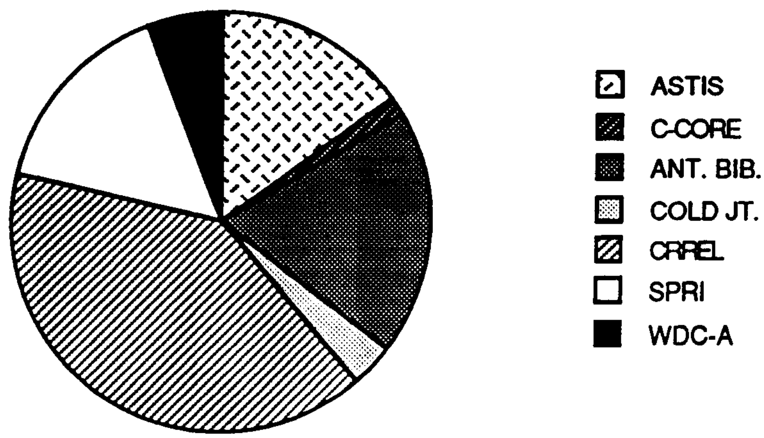
1985-90: ATMOSPHER* OR CLIMAT* OR OZON* OR METEOROL*



No. of records: 11,946

Fig. 12a

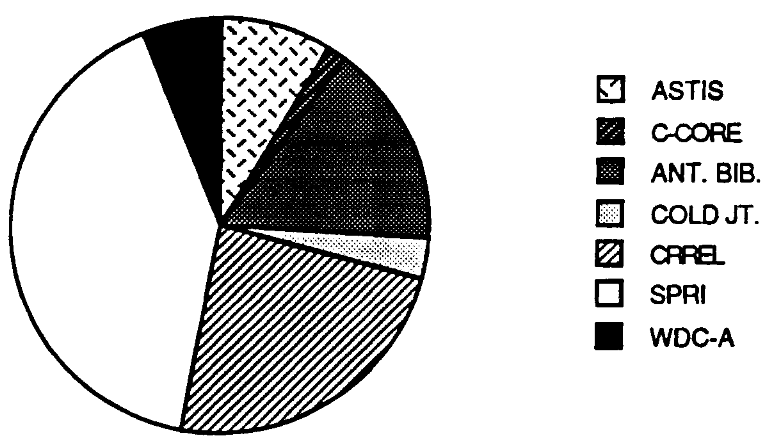
Entire CD-ROM: GEOLOG* OR GEOMORPH* OR GEOPHYS* OR MINERAL* OR PALAEONTOL* OR PALEONTOL* etc.



No. of records: 53,303

Fig. 12b

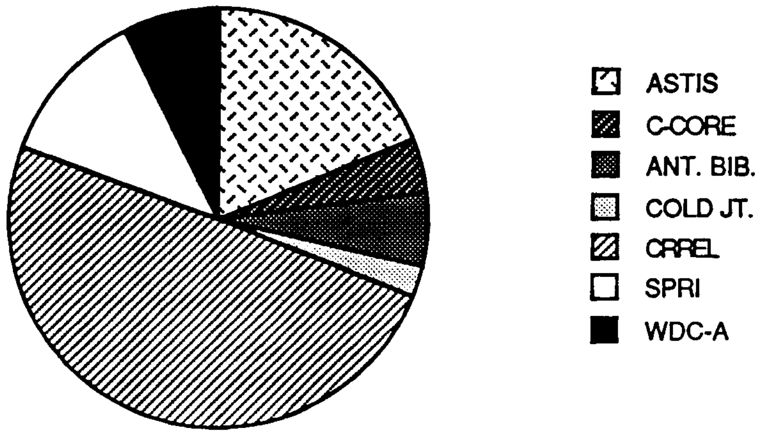
1985-90: GEOLOG* OR GEOMORPH* OR GEOPHYS* OR MINERAL* OR PALAEONTOL* OR PALEONTOL* etc.



No. of records: 14,923

Fig. 13a

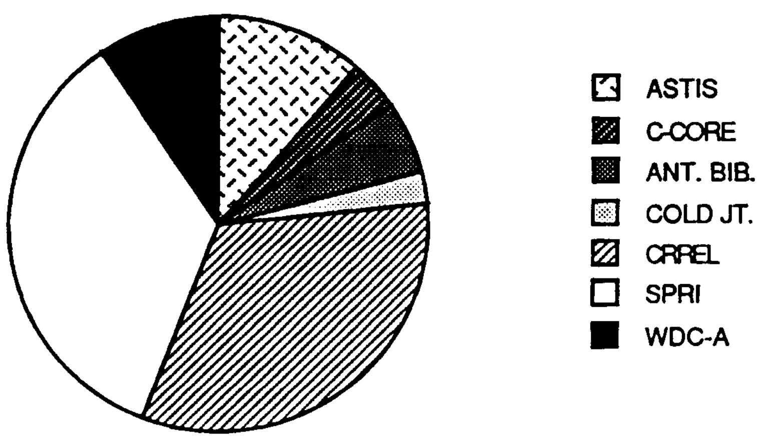
Entire CD-ROM: ENGINEER* OR CONSTRUCTION OR TRANSPORT* OR BUILDING*



No. of records: 31,443

Fig. 13b

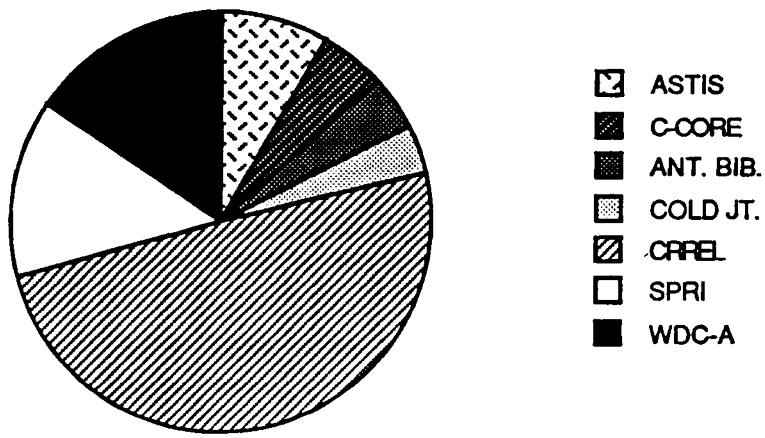
1985-90: ENGINEER* OR CONSTRUCTION OR TRANSPORT* OR BUILDING*



No. of records: 8,165

Fig. 14a

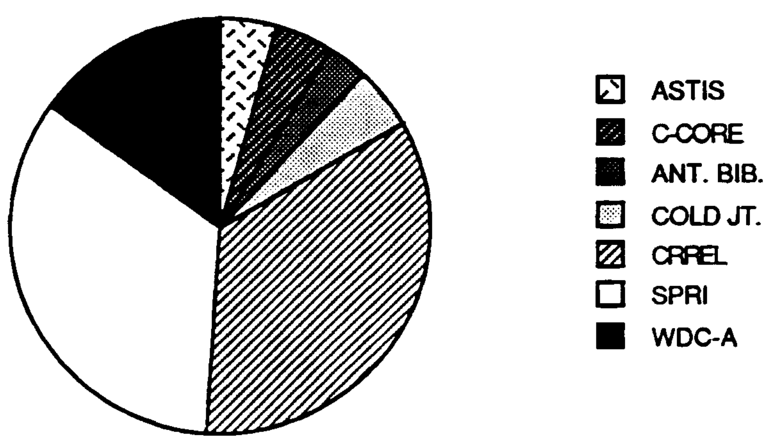
Entire CD-ROM: GLACI* OR SNOW* OR PERMAFROST* OR PERIGLACIAL OR GEOCRYOLOG*



No. of records: 155,579

Fig. 14b

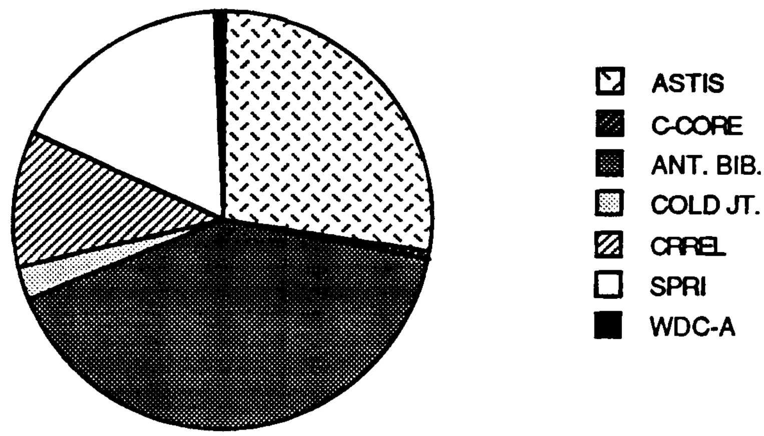
1985-90: GLACI* OR SNOW* OR PERMAFROST* OR PERIGLACIAL OR GEOCRYOLOG*



No. of records: 44,140

Fig. 15a

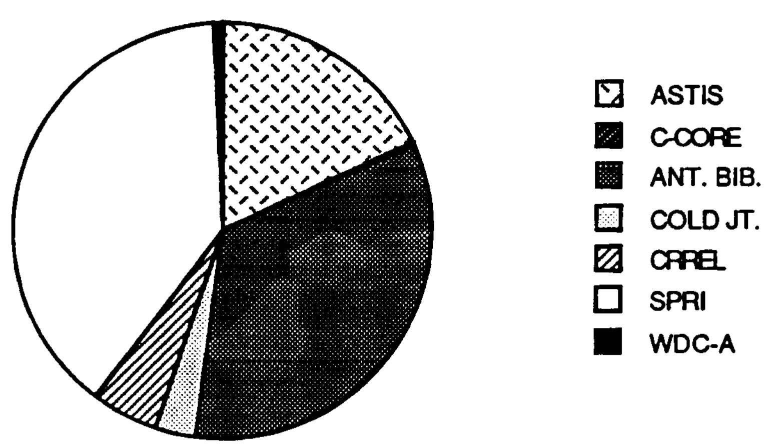
Entire CD-ROM: BIOLOG* OR BOTAN* OR ECOLOG* OR ZOOLOG* OR MAMMAL* OR BIRD* OR FISH* etc.



No. of records: 33,789

Fig. 15b

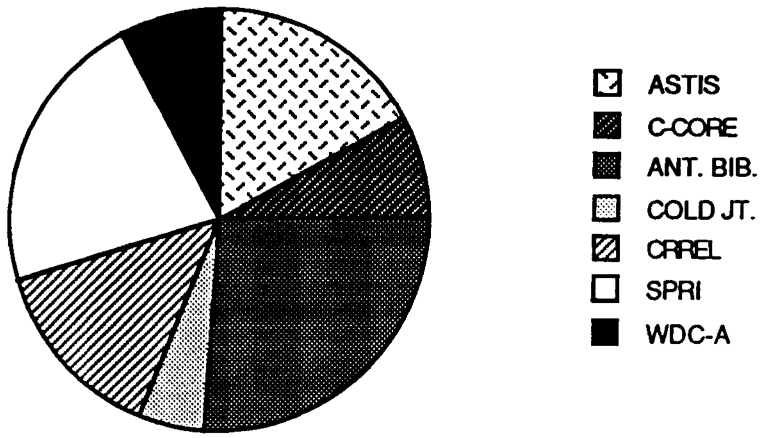
1985-90: BIOLOG* OR BOTAN* OR ECOLOG* OR ZOOLOG* OR MAMMAL* OR BIRD* OR FISH* etc.



No. of records: 11,158

Fig. 16a

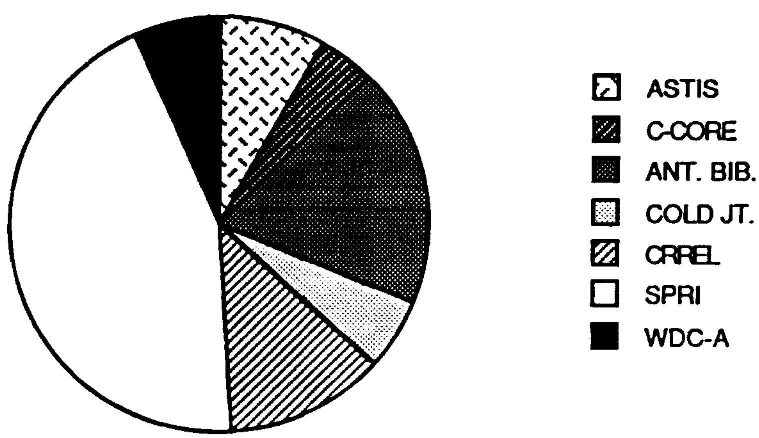
Entire CD-ROM:
OCEAN* OR MARINE



No. of records: 35,577

Fig. 16b

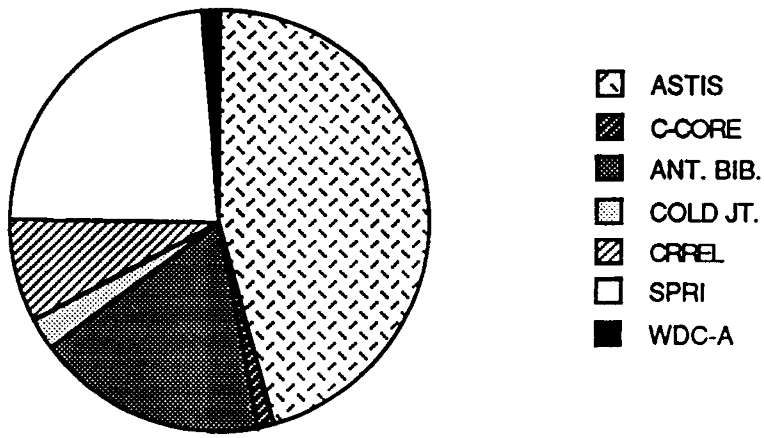
1985-90:
OCEAN* OR MARINE



No. of records: 12,603

Fig. 17a

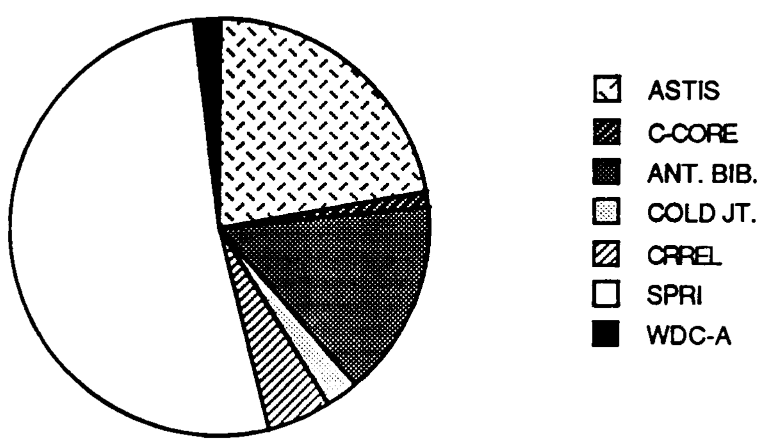
Entire CD-ROM: SOCIAL OR POLITIC* OR ECONOM* OR INUIT OR INDIAN* OR ESKIMO* OR NATIVE* etc.



No. of records: 32,802

Fig. 17b

1985-90: SOCIAL OR POLITIC* OR ECONOM* OR INUIT OR INDIAN* OR ESKIMO* OR NATIVE* etc.



No. of records: 9,733

THE NOAA LIBRARY AND INFORMATION NETWORK

Janice Beattie
NOAA Library
Rockville, Maryland 20853

"The oceans and atmosphere are interacting parts of the total environmental system upon which we depend, not only for the quality of our lives, but for life itself.

We face immediate and compelling needs for better protection of life and property from natural hazards, and for a better understanding of the total environment -- an understanding which will enable us more effectively to monitor and predict its actions, and ultimately, perhaps to exercise some degree of control over them.

We also face a compelling need for exploration and development leading to the intelligent use of our marine resources. We must understand the nature of these resources, and assure their development without either contaminating the marine environment or upsetting its balance."

With these words, in July 1970, President Richard M. Nixon proposed the creation of a new agency -- the National Oceanic Atmospheric Administration (NOAA). On October 3, 1970, NOAA was formed. This new Administration joined together 3 agencies with well respected histories -- the National Weather Service (1890), the National Marine Fisheries Service (1871) and the Coast and Geodetic Survey (1807).

In 1971 the library collections of the three organizations merged to form the NOAA Central Library in Rockville, Maryland. Shortly after, the Library and Information Services Division was established to provide scientific, technical, and legislative services and products for the NOAA scientists, researchers, administrative staff, and others working in NOAA-related disciplines. In fulfilling its mission, the Division formed the NOAA Library and Information Network (NLIN).

NLIN is comprised of the NOAA Central Library in Rockville, three Regional libraries at the NOAA Western Regional Center in Seattle, Washington; the Atlantic Oceanic and Meteorological Laboratory in Miami, Florida; and the National Hurricane Center in Coral Gables, Florida. The bulk of the network is composed of approximately 30 libraries and information centers that are independently administered by other line offices in NOAA. Most of the libraries and information centers are located in NOAA's fisheries, weather, and environmental research labs around the country.

Libraries in the NOAA Network contain special collections covering a wide variety of topics, from shrimp to satellites to climatology. Other special collections contain information on green turtles, fish oil, severe weather, fish pathobiology, atmospheric physics, zebra mussels, meteorology, effluent plume behavior, astonomics, and hydrology, to name a few. The materials owned by NLIN pertain to the environment extending from the bottom of the sea to the sun. Most of the collections relate to regional animals and conditions, such as the Pascagoula Library's video collection on turtle exclusion devices (TEDs) or the Seattle Library's collection of materials about marine mammals.

During the 1980's the Central Library provided the impetus to coordinate centralized access to the materials located in the libraries throughout the NLIN. By 1982 they had developed an online in-house system on a mini-computer. After some down-time at the Central Library in the mid-1980's while asbestos was removed from the facility, the staff focused on improving access to the NLIN holdings. A system assessment and changes in technology led them to CD-ROM technology, and the idea for NOAALINC (Library Information Network Catalog) was conceived. By 1989 NOAALINC was installed in several of the libraries nationwide.

The EPA Headquarters Library and NOAA Central Library have always enjoyed a good working relationship, partly because of the environmental thrust of the agencies. During 1990 EPA Headquarters Library staff visited the NOAA Central Library and saw a demonstration of NOAALINC, and during that visit an idea was born. It was the notion that a CD containing the holdings of both Library Networks would be a valuable tool. After much discussion and negotiation, the EPA and NOAA agreed to work together (along with The Library Corporation, the contractor supplying the technical support) to add the EPA Library Network holdings to NOAALINC, establishing the NOAA/EPA LINC CD. At the present time, there are more than 280,000 records on the CD-ROM.

The NOAALINC does not reflect all the holdings of the NOAA libraries. The NOAA Central Library alone has a collection of 1,000,000 volumes, 9,000 serial titles in all major languages, 1,500 currently received journal subscriptions, 35,000 reports and meteorological data publications from approximately 100 countries.

MODERNIZATION OF THE COLD REGIONS BIBLIOGRAPHIES AT THE LIBRARY OF CONGRESS

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Abstract

After a recent review of the Cold Regions bibliography production, the National Science Foundation (NSF) and Cold Regions Research and Engineering Laboratory (CRREL) sponsors have approved a plan for modernizing the process. The plan calls for updated hardware and software, an independent host computer, and real-time access for users. A new software system has been designed and ordered, and an interim upgrading of the citation input method is being adopted. The overall modernization plan is scheduled to be completed by 1994.

Introduction

The first step in automating the production of the CRREL and Antarctic bibliographies was taken in 1969, when keying of entries into the database on the Library of Congress (LOC) mainframe was begun. This system also provided for sorting and batch processing of the new entries, to be transferred to photocomposition for production of the monthly and annual publications. With minor changes, this method has been used ever since. Early in 1991, meetings among the sponsors and LOC were held, in which it was agreed that it was time to modernize the whole process in the interest of both cost effectiveness and greater user accessibility. This paper describes the planning process used in designing the new system, the redesign concept that has evolved, and progress to date in executing the plan.

Planning Process

Several meetings with the sponsors were held in March and April 1991 to assess the current situation with the Cold Regions bibliographies, and to adopt a method for improving their production. The planning model followed was one used recently by CRREL for upgrading its own system, in which a detailed Information Systems Plan (ISP) had been developed. Based on this method, a joint Planning Committee including the sponsors and LOC was then appointed to generate an ISP for modernizing our bibliography production. The objectives agreed on were the following:

* Improve the workflow process of the Cold Regions bibliographies

* Use new technology to avoid duplicate effort and to better use the talents of the professional staff

* Provide sponsors and outside users with real-time access to the database

* Provide increased coverage and service at level or reduced funding

* Review the end products of the project and change if appropriate.

The output of the Planning Committee was to be a plan for modernization, to be submitted to both NSF and CRREL sponsors for approval, since some level of added funding was anticipated for start-up costs in any new system. The schedule called for the final ISP to be completed by 30 June, 1991; to allow one month for sponsor review and approval, and to start implementing the plan by 1 October, 1991, with modernization to be completed by the end of 1993.

The main graphical tool used in the plan was a 3x3 matrix listing the categories of technology, personnel and funding vs. baseline (present), intermediate (FY 91-92), and target (FY 93-94+) dates, as shown below. A separate such matrix was included for each of the three categories.

	Baseline	Intermediate	Target
Technology			
Personnel			
Funding			

PLANNING MATRIX

The plan also included a list of agreed assumptions, which include: that the project will continue to be operated by LOC under core funding from NSF and CRREL; that technologies required for the modernization are currently available; that staffing and products will remain the same; that the current publication system will continue in use until the new system is performing acceptably; and that NSF and CRREL will provide funding for start-up costs of the modernization.

The categories of personnel and funding in the matrix will be the least affected in the updated system. Staffing will remain level, and funding will continue to be provided for annual operating costs, plus whatever may be needed for startup and database management costs in any new system. The major change will be in technology, namely the hardware and software needed to modernize the present system. The plan calls for replacing the present system with a local area network (LAN) of PC workstations to be installed at the project site, with each project member to have an IBM-compatible PC, printer, and optical reader access. This LAN will connect to a host computer as well as to Internet and to the LOC mainframe; the entire database will be copied to the host, where future additions and corrections can be directly entered. The sponsors and other users will thus have real-time search access to the database via Internet, which solves one of the current problems: the most up-to-date version now available to users is the COLD version of the database in ORBIT, which is updated only quarterly, followed by the CD-ROM, now updated semiannually. Use of PC word processors should also greatly improve the input rate of accessions, particularly whenever the optical scanning feature can be added for copying of abstracts from the source text.

A number of other features are called for in the new inputting system to streamline the citation writing process. These will include aids such as pick lists for selection of proper terms, field validation procedures, automatic sequential assigning of ID numbers, password protection for write access, and other aids that will make the entry process quicker and more accurate. We have given special attention to this area, since citation writing is the most labor-intensive operation in the bibliography process.

At the time of writing the ISP there was no good way of arriving at a cost estimate, so an educated guess was made of $100,000 to $150,000 as the likely price range for start-up of the modernization. After the plan was submitted in July 1991, NSF approved a grant for $50K for the effort to be spent in FY 1992, and CRREL later did the same, so the project currently has $100K to get started.

The Plot Thickens: Enter LOC's Computer Staff

The major computer functions at LOC are managed by its computer staff, known as Information Technology Services (ITS). This includes the Cold Regions database, which now resides on an ITS mainframe. ITS staff are responsible for maintaining our database, as well as managing the production jobs for publication and the periodic tape updates of new material; these services are in fact line items in our sponsors' budgets. Since ITS has been intimately involved with the Cold Regions database from the beginning, they were invited to join in the planning for its modernization. This is particularly pertinent, since under one proposed scenario, ITS would continue to provide the publication functions as now, even if we do add an independent host for the database.

ITS management agreed to assist in the planning effort, and its staff have given generously of their time and expertise. An initial ITS suggestion was adopted by the Planning Committee, namely, that the modernization effort be started in two phases: an interim phase in which some immediate upgrading could be done to the citation input process, and a long-term phase for new software design and procurement as specified in the plan. The interim phase is now under way; PC workstations are being installed in the project, so that staff can now key new material to disk files for direct upload to the database. This at least eliminates the clumsy keying and queuing/dequeuing process which has been used for so long.

We assumed in the plan that software for any new system would be bought from a commercial vendor, probably in some form of off-the-shelf plus custom software. Since LOC could not justify a sole-source procurement in this case, the procurement had to be competitive, so a Request for Proposal (RFP) to vendors was required. ITS staff were assigned to write the Technical Specification for the RFP, and also to act as Contracting Office Technical Representative (COTR) during the procurement. After extensive review and amendment, the specification was approved and the RFP was issued in May, 1992. Several vendors responded, and after technical and cost evaluation a contract was awarded to Cuadra Associates in September for a customized version of their STAR database management system. STAR is already in use elsewhere in LOC, and has proved to be a versatile and powerful software package.

Purchase of hardware is excluded from this procurement. CRREL has space available for the database on its Sun minicomputer, and ITS has now agreed to buy a Sun/Unix for testing the new system. I should also point out that careful consideration was given to the weight of the various factors which determined the awarding of the software contract. We will be replacing a system that has operated successfully for over two decades, and would like to be assured that its successor can be equally reliable, even if not as long-lived in view of today's rapidly developing technologies. For example, a delivery schedule will be included in the RFP but will have low weight in the overall assessment; it is far more important that performance specifications be fully met than that the new software be delivered by some arbitrary date. In any event, the old production system will be kept going until we are fully confident that the new process can do the job, so there will be a period of parallel operation which will allow time for the new system to come up to speed.

That Was Then, This Is Now: Modernization Begins

As already mentioned, the first step in the redesign process has been to install PC workstations for the Cold Regions Project staff. We now have three IBM-386s working, loaded with WordPerfect 5.1. So far these are stand-alone stations, but will soon be tied into a LAN which is now being installed for the entire Science and Technology Division. A couple of months' experience has shown that WordPerfect is a good fit for our type of input. For example, we have loaded in both the CRREL thesaurus and the Antarctic thesaurus as one file in each PC for quick reference, which can be used in a toggled split-screen mode, with text on top and thesaurus on the bottom. This is particularly useful because keyword selection is a notorious source of error. The two thesauri have many nearly identical terms, and other inconsistencies, e.g. "primary productivity" is an OK term for Antarctic items, but not for CRREL items, where one must use "biomass" instead.

Entries are now being copied to diskette and delivered to a project library technician, who adds the mandatory MARC field codes ($, #, etc.) automatically with the global "replace" function, adds abstracts where needed, does a spell-check, and merges the entries into a weekly file. The weekly diskette is converted to DOS and uploaded to our database on the mainframe. Strictly speaking, we do not have real-time access to our own database; it resides on tapes in ITS, and has to be mounted whenever it is to be used. To counter this constraint, we are now keeping a cumulative disk file of new accessions, with copies at all work stations; this is useful for several reasons, such as checking for duplication of entries.

Experience even in this short interval has shown that this is a vast improvement over the previous entry method. Productivity is already increasing, and the keying error rate is way down. I will predict confidently that the Antarctic and CRREL volumes currently being generated will show a substantial increase in size over recent issues. We should see still further improvement when the balance of the work stations are installed and the LAN hookup is made.

The interim method described will be used until our new system is up and running, which means we will be operating in this mode for a year or more.

Wait, It Gets Better: Long-Term Improvements

Once the new system is in operation there are several logical extensions that we can anticipate for the long term. An important one of these is to extend citation input to outside sources, as David Walton has urged. Publishers of some foreign journals could in principle generate citations of their own material and transmit them to the database, thus avoiding duplicate exploitation of the source and reducing workload within the project. Two main problems to be addressed here would be the need to devise some form of conversion to whatever format the new system may require, and the need to include full text of the cited item for microfiching, until or unless fiche will no longer be a required product.

Citation generation is not inherently difficult, but it can be complex; the format includes more than 50 MARC fields, each with its own rules and many with multiple subfields as well. There will be help in the new software, which will include as many prompts and validation checks as we could think of for citation fields, but even with these aids the citation process will remain a demanding one. Among other things, it requires familiarity with permissible keyword (thesaurus) terms, which now number some 1,750 for CRREL and 560 for Antarctic items. (The Cold Regions staff at LOC have come to regard citation writing as virtually an art form, and are most dubious about outsiders being able to master it, particularly if done as a voluntary exercise). In any case we would provide some type of holding file for outside entries, to allow for editorial checking.

Other advances contemplated could eventually include full text inclusion and broader user access via Internet. The advanced stages will depend on how the new system is implemented, and should be considered further when the new process is fully in place.

There are some other new features to be mentioned, which are not part of the new plan but which should enhance the process as well. For example, we have started two auxiliary files to aid in the source retrieval process. One of these is a cumulative file listing all worldwide conferences, symposia, workshops, etc. that pertain to cold regions. This is useful both because proceedings of such meetings are a rich source, and because the proceedings themselves tend to be elusive. This file, dating from 1990, already lists over 90 current and upcoming conferences of interest.

The second file is a log of the serial journals being most frequently cited. Until now we have not had rigorous document control of serials, and since they account for more than half of all database entries, it is important that they be tracked. I recently listed all serial journal titles cited over the past three years, and got a net total of over 1,200 titles for both Antarctic and CRREL bibliographies. I sorted these by their frequency of citation in the CD-ROM, and have arbitrarily chosen to log in all titles with 100 or more citations, which amounts to some 112 titles. The list will have to be amended for any newer high-yield titles that don't yet show big numbers in the database, but it should at least give us proper control of the highest yield journals.

Finally, we have taken some initial steps toward better capture of gray literature. As a start, we selected all the libraries on our mailing lists, and sent them a form letter soliciting any type of gray literature they may receive. The response to this has been positive, and we have already received some useful added material. Further solicitations, including billboard "shout" messages, are being planned.

Conclusion

The planning process for the modernization has been a long and painstaking one, with much valuable input from all parties. I believe that the specifications for the new system are as complete as they reasonably can be, and should pose no major difficulties. The STAR software appears to be the best option open to us, and should serve us well after any startup problems are solved. Substantive questions remain as of this writing, such as where the host computer will ultimately reside and whether LOC will continue to publish the printed products, but these need not delay procurement and test of the new software. As the new manager of the Cold Regions bibliographies, I feel fortunate to be a part of the modernization process, which all agree is long overdue. I hope that by the time of the next Colloquy I can report our new system up and running.

Acknowledgments

Many people from CRREL, NSF and LOC have contributed to this planning effort, and I appreciate all their expertise and support. I particularly want to thank Helen Cheng, who was tasked by ITS to write the new software specification, which she completed after coping patiently with seemingly endless amendments. It was Helen who persuaded the planning committee to include modernization of the production as well as the input portion of the system, and she also arranged the transition to the new method of disk upload directly to the database. I also want specially to commend Jim Godwin of ITS, who performed the thankless job of COTR with skill and patience, and guided the lengthy procurement process to its successful conclusion. My thanks finally to all other participants: Joe Roberto, Nancy Liston and Gregg Hoge of CRREL; Guy Guthridge, Ruta Godwin and Dan VanBelleghem of NSF; and Joe Price, Herb Becker, Bob Palian, Larry Fitzgerald, Donna Eckley and Katherine Phillips of LOC, for all their contributions to the planning and procurement process.

BUILDING A CANADIAN POLAR INFORMATION SYSTEM

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Abstract

The proposed Canadian Polar Information System (CPIS) has moved significantly closer to reality during the past two years. Several studies relating to the design and development of a CPIS have been successfully completed. The Canadian Polar Commission was created in September 1991. This Commission has agreed to support further CPIS design work and has set up a Committee to investigate possible management structures, market potential and funding possibilities for a CPIS.

Introduction

This is the third Polar Libraries Colloquy at which the evolution of the Canadian Polar Information System (CPIS) will be discussed. At the Twelfth Northern Libraries Colloquy, two papers on this topic were presented: *The Merger of the BOREAL and ASTIS Databases: Genesis of a Canadian Polar Information System* (Minion and Goodwin, 1988) and *A Conceptual Framework for a Canadian Polar Information System* (Kamra, 1988). A further two papers were presented at the Thirteenth Polar Libraries Colloquy: *Designing a Canadian Polar Information System* (Goodwin and Minion, 1990) and *Incorporating Corporate Memory in a Canadian Polar Information System* (Kamra, 1990). To be able to present another paper at another Polar Libraries Colloquy relating to a CPIS is encouraging. Despite a difficult economic climate there continues to be substantial support of this project not only by our own institutions but also on a national level. This support has been translated into money. Funds have been made available to enable significant progress to be made on the design and implementation of a CPIS. A description of the evolution of a CPIS up to June 1990 is found in the previously presented papers and readers should refer to these papers since the details will not be repeated here. This paper will provide an overview of progress made since the last Colloquy.

On a national level, the most critical event that has taken place since the last Colloquy was the creation on September 16, 1991 of the twelve member Canadian Polar Commission. The Commission is chaired by Whit Fraser, a journalist and former CBC host who has extensive experience as a journalist in the North and was a resident of the NWT for 11 years. He was instrumental in developing native language broadcasting and for bringing many northern events and issues, such as the Berger Inquiry, to a southern audience.

The other Commission members come from a broad range of backgrounds. They all have substantial experience with and interest in northern issues. Among the members are the Director of the Centre d'etudes nordiques at Laval University, the Executive Director of the Science Institute of the Northwest Territories, a member of the Inuit Broadcasting Corporation, several past and present members of the Association of Canadian Universities for Northern Studies, several northern oriented academic researchers and individuals who have been previously active in government in northern Canada. In order to be at 'arm's length' from government, current full-time employees in the public service of Canada are not eligible to serve as members of the Commission.

The Canadian Polar Commission had established an office in Ottawa and will establish at least one office north of sixty degrees. The Commission is scheduled to meet 4 times a year and at least half of the meetings are to be held north of sixty degrees.

The role of a CPIS is woven throughout almost all the tasks of the Commission as described in Section 4 of *An Act to Establish the Canadian Polar Commission*. The purpose of the Commission is "to promote the development and dissemination of knowledge in respect to the polar regions" (Canada Parliament, 1991). This is a broad statement of purpose but it is clear that a CPIS can play an essential role in effecting this mandate. Canada has many polar publishers and polar libraries but no coordinated national system to ensure access to all that information.

The Canadian Polar Commission is to achieve its mandate by "monitoring the state of knowledge ... in respect of the polar regions" and by "cooperating ... in the determination of scientific and other priorities". Without a comprehensive inventory of Canadian polar researchers, research projects and research reports, which could be provided by a CPIS, the Commission will have no quantitative and objective information with which to identify research duplication and research gaps. The Canadian Polar Commission is also charged with "encouraging Canadian organizations, institutions and associations to support the ... dissemination of knowledge in respect to the polar regions". By getting those organizations to work together in a cooperative information network, the CPIS would again be assisting the Commission in fulfilling its mandate. By sponsoring an established program such as the CPIS, which already has an active partnership with major Canadian polar information stakeholders, the Commission will be seen to be already doing something. This may prevent it from suffering the same fate as the Science Council of Canada and the Economic Council of Canada, which were perceived as doing very little.

The Canadian Polar Information System is actively seeking the sponsorship of the Canadian Polar Commission. As soon as the Commission members were appointed, they were sent the document *Sharing Knowledge, Sharing Resources: A Plan for a Canadian Polar*

Information System (Minion and Goodwin, 1991). The document describes the authors' current thinking, and what they believe to be the current national consensus on the design of the Canadian Polar Information System. The results of CPIS design work up to September 1991, including the results of three CPIS background studies, are summarized. The steps that must now be taken to finish the design and begin the construction are described.

In addition to sending all Commission members this document, Ross Goodwin and Robin Minion made a presentation on the CPIS to the founding meeting of the Canadian Polar Commission in Yellowknife in November 1991. As a result of these discussions, the Canadian Polar Commission established a Committee to investigate possible relationships between the Canadian Polar Information System and the Canadian Polar Commission. The CPIS Committee consists of Dr. LLoyd Barber who, as President of the University of Regina was involved in the development of the Canadian Plains Database, Marc-Adelard Tremblay, a professor emeritus of Anthropology at the Laval University who represents the interests and concerns of French Canadians and Dr. George Miller, Vice-President for Research and Technology Development at NOVA Corporation and President of NOVA HUSKY Research Corporation. The Canadian Polar Commission has agreed to support and fund the design and development of a CPIS but the role of the Commission in the operation of an established CPIS is undecided.

Among the issues to be addressed by the CPIS Committee of the Canadian Polar Commission are responsibility, ownership and management of the CPIS. Management of a CPIS will be time-consuming and it will take significant funding to establish and operate a CPIS. To assist the Canadian Polar Commission in the development of a management structure for a CPIS, Brian Pratt of Western Management Consultants was hired. In January 1992, Pratt submitted a draft document entitled *Preliminary Ideas on Management Structure for the Canadian Polar Information System (CPIS)* (Pratt, 1992a) to the Commission. This document is not publicly available. It was intended as a basis for discussion by the Commission relating to the possibility of establishing a not-for-profit corporate framework for a CPIS.

Brian Pratt has also produced another draft document for discussion by the Canadian Polar Commission. This document *A Preliminary Assessment of Markets for a Canadian Polar Information System (CPIS)* (Pratt, 1992b) represents Phase I of a two phase study. The purpose of Phase I is to develop an analytical framework within which one can apply estimates of number of users, product revenues, and the value of benefits to users. It includes a review of *Final Report, Background Study on the Needs of Potential Users of a Canadian Polar Information System* (Goodwin and Minion, 1991). Pratt's document was submitted to the CPIS Committee of the Canadian Polar Commission in late April 1992 and will be used as a basis for discussion by the Commission at their meeting in Whitehorse in May 1992.

Prior to the establishment of the Canadian Polar Commission in September 1991, Indian and Northern Affairs Canada, Circumpolar and Scientific Affairs Directorate continued its long-standing support of the development of the Canadian Polar Information System. As a result of a Workshop on Yukon Information and a Canadian Polar Information System which was held in Whitehorse in April, 1990, the Directorate awarded a contract for the study of the Yukon's role in a CPIS. The contract was managed by the Yukon Science Institute on behalf of the Yukon committee for CPIS. K-L Services Whitehorse was hired to conduct the study and a final report, *The Role of the Yukon in the Canadian Polar Information System* (Krangle and Long, 1990) was delivered in October 1990. The report contains an overview of the extent of northern collections and databases housed in the Yukon. It also concluded that Yukoners are excited about a CPIS and that a CPIS production centre should be located in the Yukon.

In addition, the third CPIS background study, which was also funded by the Circumpolar and Scientific Affairs Directorate, was completed in May 1991. The findings of this background study, *Final Report, Background Study on the Needs of Potential Users of a Canadian Polar Information System* (Goodwin and Minion, 1991) will be reported on elsewhere during this conference. The first two background studies *Final Report, Background Study on Subject and Geographic Access Methods for a Canadian Polar Information System* (Minion and Goodwin, 1990) and *Final Report, Background Study on the Organizational Structure of a Canadian Polar Information System* (Goodwin and Minion, 1991) were briefly summarized at the last Colloquy.

Since its establishment, the Canadian Polar Commission has provided CPIS with significant funding to continue development and implementation work. Two contracts totalling $45,500 were awarded to undertake Phases I and II of the fourth and final background study. A draft of *Technical Design of a Canadian Polar Information System - Phases I and II. Bibliographic Formats* (Minion and Goodwin, 1992) was submitted to the Canadian Polar Commission and the participating specialists in March. In the first two phases of the study, current descriptive indexing, record format and display standards for bibliographic records were reviewed through a visit to several organizations in the Ottawa area and a literature search. A telephone survey of 45 Canadian polar information centres examined descriptive indexing methods, record formats, hardware and software usage and collection size.

This study recommends that the *Anglo-American Cataloguing Rules, Second Edition* be used as the descriptive indexing standard for those fields in the CPIS bibliographic record to which they apply. It recommends, and describes, a relatively simple custom format for CPIS bibliographic records. It recommends, and describes, long and short display formats for CPIS bibliographic records.

The next phase of the CPIS technical design study will be to select a computer network structure and choose hardware and software for a CPIS.

The Canadian Polar Commission also awarded CPIS a contract for $54,300 for the first phase of a two-phase project to develop the English version of the CPIS Subject Thesaurus,and to simultaneously convert the records of the Arctic Science and Technology Information System (ASTIS) to use this new thesaurus. The English version of the CPIS Subject Thesaurus is being prepared at the Arctic Institute of North America because:

- the existing ASTIS Subject Thesaurus is the best starting point for the CPIS Subject Thesaurus;
- the ASTIS staff is experienced in thesaurus construction and management;
- ASTIS has the necessary thesaurus management software;
- the ASTIS database will need to be converted to use the CPIS Subject Thesaurus eventually, and can be converted while the thesaurus is being developed;
- working with a representative collection of bibliographic records, such as those in ASTIS, while developing a thesaurus ensures that the level of detail of the thesaurus is appropriate to its use, and that the thesaurus terms chosen are practical when used by actual indexers on actual bibliographic records.

Once the English version of the CPIS Subject Thesaurus is completed, other existing Canadian Polar databases can be converted to use it, and the French version of the thesaurus can be prepared.

Finally, the Canadian Polar Commission also provided funding to print a large number of copies of *Sharing Knowledge, Sharing Resources: A Plan for a Canadian Polar Information System* (Minion and Goodwin, 1991). The report provides an up-to-date summary of CPIS work for the many polar information specialists and polar information users who have participated in the CPIS design effort, and will help those who have not yet participated to better understand the proposed system. The report will receive wide distribution both in Canada and beyond.

A list of design and development tasks for 1992/93 has been prepared and submitted to he Canadian Polar Commission. It is expected that the Commission will reach a decision about the level of funding it is prepared to undertake during the current fiscal year at the meeting which is being held in Whitehorse. Nine possible tasks have been identified. The highest priority task is completion of the English subject thesaurus and ASTIS subject conversion. The next task in terms of priority is choosing the network structure to be used by CPIS and selecting the hardware and database management software to be used. Among the other tasks are writing the software, writing the indexers manual, developing the CPIS geographic thesaurus while simultaneously converting the ASTIS database, developing a French subject thesaurus, choosing formats for other information types and begin converting the descriptive part of existing BOREAL and ASTIS bibliographic records to the CPIS format.

The Canadian Polar Information System has the potential of ensuring that existing information is disseminated widely and used effectively by simplifying the process through which users find the information they need or want. A CPIS will achieve this through cooperation among existing institutions and organizations. It will lead to improved polar research productivity and effectiveness and ultimately better decision-making by government and industry.

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BIBSYS AS A POLAR LITERATURE DATABASE

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Abstract

BIBSYS is a library database for the university libraries and some college libraries in Norway. In 1990 the Tromsø Museum Library received grants from the University of Tromsø and local business companies to convert its polar collection to BIBSYS. This paper will give an evaluation of the polar literature in BIBSYS and future plans.

Introduction

In Norway there are two major library database systems. The University Library of Oslo is responsible for the national bibliographies and the union catalogue of foreign books.

The other system is called BIBSYS and is a shared, automated library system for the universities of Norway and some scientific colleges. It includes all the major functions of the library: acquisition, cataloguing, loan and search. The system came into operation about 1980 and today contains nearly a million bibliographic references. In addition, about 2 million records from the U.S. Library of Congress (1986-) and 200,000 records from the Norwegian National Bibliography (Normarc, 1971-) have been loaded into the system.

The polar literature in BIBSYS constitutes an important part of the University's book collection. Ever since Tromsø Museum, the forerunner of Tromsø University, was established in 1872, Arctic research has been a major field of activity. The town of Tromsø, "the gateway to the Arctic" is closely linked with the Arctic and the Polar seas, being the starting point of numerous hunting and research expeditions. The establishment of the University of Tromsø resulted in an increase in polar research activities which soon became an area of special priority. In 1988, the University's senate established a centre for Arctic research, The Roald Amundsen Centre. It is an umbrella organization for all those involved in polar research at the various institutes at the University. Its main goal is to promote the activity by disseminating information and providing facilities for researchers.

The University Library of Tromsø has, as a natural consequence of the town's history, a very fine collection of polar literature dating back to the end of the last century. The collection has been built up through exchange of publications, gifts and regular purchase. It is a top priority task to conserve, develop and disseminate the Arctic literature to users at the University and elsewhere.

Funding

In 1990, the Roald Amundsen Centre initiated the creation of a database for polar literature. At a meeting which was arranged with some banks, business firms and insurance companies of the town, NOK 75,000 (USD $11,500) was spontaneously given. A project group was established with representatives from the University Library, Tromsø Museum and the Roald Amundsen Centre.

Later the University Library funded the project with NOK 40,000 (USD $6,000), Tromsø Museum with NOK 15,000 (USD $2,300), the University Administration with NOK 20,000 (USD $3,000) and the Varming Committee with NOK 17,000 (USD $2,500).

Future Plans

The main idea behind the project is to record all the polar literature which Tromsø Museum has acquired before 1980 in BIBSYS. After 1980, the literature is continuously being recorded. In addition, the polar collection of Tromsø Public Library and the Polar Museum of Tromsø is to be recorded together with the polar collection of Henrik Varming in Longyearbyen, Svalbard. The project will be completed in May or June of this year. After that, researchers, teachers and students can get a complete survey of the polar literature which is to be found in the town of Tromsø and in which library or institution.

Scope

Document Types

The database contains monographs only and not periodical articles. Articles are only included if they have been published as offprints. So far about 5000 units (docid numbers) have been recorded. These include both extra copies and single volumes in series. With the exception of a serial publication from the Norwegian Polar Research Institute current series from Arctic institutions have not been analyzed and included. Single volumes in series have only been included if they are recorded in the card catalogue.

Geographical Limitations

Antarctica has not been defined specifically. The Arctic is defined as areas north of the July 10° isotherm which roughly corresponds to the northern tree limit. It includes the greater part of Iceland, Greenland, the northern coastal areas of Norway, Russia, Siberia, Canada and Alaska. This limitation is problematic. Works within neighboring regions have sometimes been included if they also contain information about areas further north. We have tried to include works where the Arctic constitutes the main part, but some books where the Arctic only makes up a part have sometimes been included.

The Polar Collections Recorded In BIBSYS

The literature we have recorded consists of four separate polar collections. As the database also serves the purpose of a union catalogue for polar literature the various collections overlap to some degree.

The Polar Collections Of:

Tromsø Museum Library

The library dates back to 1872 and spans the disciplines of the various departments of the museum which include both natural sciences and humaniora: botany, zoology, geology, archaeology, regional and saami ethnology, local history. Within these disciplines the collection is quite good. In some way we can consider the whole library as an Arctic collection as most research is related to Arctic or the sub-Arctic in some way. Part of the material is irrelevant and not much in use owing to exchange of publications, on which we were quite dependent before the war. The library has received important gifts, the most valuable being that of Just Qvigstad's collection of Saami works. The donations by Karl Pettersen and Väinö Tanner were important contributions to the geology section. The first qualified librarian was employed in 1953 and since then we could more systematically specialize in works related to the Arctic and sub-Arctic. In recent years we have bought quite a lot of polar literature through antiquarian catalogues. Now that the literature is recorded in BIBSYS it much easier to see what we lack.

Tromsø Public Library

The library serves the general public. The interest for Arctic literature in the town of Tromsø has always been great. A qualified librarian was employed before the war and from the thirties he started collecting books for the library's Arctic collection. The library's coverage on humanistic literature is quite good, covering especially travels and expeditions, history and politics, hunting and trapping and fiction. The emphasis is on Scandinavian literature and some books are very rare, printed in Tromsø and published there in the last century. The collection contains about 2000 books. The collection is placed in the library's stack-room as a separate collection. It may only be used in the library's reading room.

Henrik Varming, Longyearbyen, Svalbard

Before he retired Henrik Varming worked as office manager in Store Norske Coal Company, Svalbard. His literary interests and pre-occupation with Arctic matters through many years resulted in a unique collection of Arctic books and maps. In 1989, a Varming committee was established to ensure that the collection was not sold on auction or separately, but remained in Longyearbyen. The collection will undoubtedly be of great interest to researchers and experts on polar affairs. In the future the collection may be integrated with artifacts from Svalbard's past. The collection contains about 60 maps and 400 books. Some of the maps are very rare, among them the 1598 edition of Willem Barents' map. Dutch map makers are represented, such as Willem Jansz Blaeu and Johannes van Keulen. The book collection spans from very rare editions to relatively ordinary literature. Before the end of last year the main part of the books were recorded in BIBSYS and the rest will be entered shortly. We also hope we may soon record the maps as they must be considered the main attraction.

The Polar Museum Of Tromsø

The Museum was established in 1978. It is a special museum for polar areas, especially those connected with the town and region of Tromsø. There are special exhibitions on trapping and research. The main attractions are an exhibition showing a trapper's station from Svalbard 1910, complete with the hut and furniture, and the exhibition of Roald Amundsen, photos and artifacts. About 600 books make up the collection. Most of them have been brought through antiquarian catalogues and some are gifts. In building up the collection, the curator tries to select books which are related to the museum and its exhibitions. There is for instance at the moment a special exhibition about the Swedish explorer S.A. Andrée and the Museum has acquired a number of books about his expeditions. Of this collection we have only recorded in BIBSYS those books which are not found in the other collections.

BIBSYS

The records are entered as a special collection. They are entered in a simple format (mini format) with classification numbers (UDC) and subject words. They will later be transferred into a BIBSYS sub-database.

Search And Retrieval

The search system in BIBSYS is simple. The commands are entered with function keys which appear at the bottom line. The system is divided into 3 separate modules, PUBSEARCH (for external users), BIBSEARCH (for internal user) and GENSEARCH (expert search). External users automatically enter the PUBSEARCH module and get the following screen:

```
BIBSYS OPAC                                                    BIBSYS SEARCH
------------------------------------------------------------------------------

            Type in Author and/or Title (or title words):

Author       :
Title words  :

                         and/or ONE of the following:

Subject/title :
Subject/person:
Corporate auth:
Exact subject :
Dewey-number  :

                                        <Press ENTER to begin searching>
------------------------------------------------------------------------------
 PF1:Help    PF2:Clear screen    PF3:Quit    PF4:Change database
 PF5:Change language/ Bytt språk   PF12:Additional commands
------------------------------------------------------------------------------
Base: BIBSYS   Subject heading: NTUB      Format: COMPLETE   Language: EN
```

We can make searches based on a number of bibliographic criteria, authors, title, subject etc. as shown on the screen.

If we make a search on Svalbard geology we get the following hit list:

```
>>> Total items found: 16 <<<
------------------------------------------------------------------------------
List of items:

 .   1  The Geology of Edgeøya and Barentsøya, Svalbard                  1978
     2  Svalbard : glasialgeologi og geomorfolo / Kristiansen, Kristoffer 1986
 .   3  Bibliography of literature about the ge / Orvin, Anders K.       1947
     4  Engineering geology of the Svea Lowland / Pewe, Troy L.          1981
 .   5  Glacial geology of the northern Barents / Solheim, Anders        1988
 .   6  The Geology of Nordaustlandet : northern and central parts       1969
 .   7  Geology of the Adventdalen map area     / Major, Harald          1972
 .   8  The Geological development of Svalbard during the Precambrian, Lo 1979
 .   9  The quaternary geology of Brageneset, N / Donner, J. J.          1957
 .  10  The geology of certain parts of Eastern / Holland, Michael Frank 1961
 .  11  The geology of the Femmilsjøen region o / Gayer, Rodney A.      1969
 .  12  Sketch of the geology of Spitzbergen    / Nordenskiøld, A. E.    1867

Type S in front of the copy(ies) to be displayed and press PF4.
Press PF6 to get a printout.
------------------------------------------------------------------------------
PF2:New search PF3:Quit PF4:Display items PF5:Head of list PF6:Expert search
PF7:BACKWARDS  PF8:FORWARD              PF12:Additional commands
```

All books recorded are classified according to The University Library's classification which is UDC. If we want to make a search on classification we have to change from PUBSEARCH to GENSEARCH. We get the following screen:

```
Velkommen til GENSØK. Skriv ?NYTT for nyheter!
------------------------------------------------------------------------------
  Gi kommando:
                                         Base: BIBSYS   Sett:    Felt: BD
```

The search program is based on Common Command Language, (CCL, ISO 8777) and all index fields are accessible. First we change the search field to UDC by writing **ind ud** in the command line:

```
Velkommen til GENSØK. Skriv ?NYTT for nyheter!
--------------------------------------------------------------------------------
  Gi kommando: ind ud
                                               Base: BIBSYS   Sett:    Felt: BD
```

Search on the classification number 919.9 (=Antarctica) gives 407 hits and we get the following list:

```
  1 . Antarctic law and politics           / Auburn, F. M.         1982
  2   The ice : a journey to Antarctica    / Pyne, Stephen J.      1986
  3 . Bouvetøya, South Atlantic Ocean : results from the Norwegian Anta 1981
  4   Discovery : the story of the second Byr / Byrd, Richard E.   1935
  5 . Research in the Antartic : a symposium presented at the Dallas me 1971
  6 .                                                              1923
  7 .                                                              1926
  8 . The stenolaematous Bryozoa           / Borg, Folke           1944
  9 . Freeliving marine nematods           / Allgen, Carl A.       1959
 10   Antarctic : a news bulletin
 11 . Of ice and men : the story of the Briti / Fuchs, Vivian      1982
 12 . Diary of the Terra Nova expedition to t / Wilson, Edward     1972
 13 . The Antarctic circumpolar ocean      / Deacon, George        1984
 14   The South Pole : an account of the Norw / Amundsen, Roald    1912
 15 . Sub-Antarctic sanctuary : summertime on / Gillham, Mary E.   1967
--------------------------------------------------------------------------------
$1 : BIBSYS : 919.9 : 407 ref.

--------------------------------------------------------------------------------
  Gi kommando:
                                             Base: BIBSYS   Sett: 1  Felt: UD
```

The external user may access the database through DATAPAK or INTERNET. (For further information see English language leaflet: BIBSYS systems description.)

Concluding Remarks

The University of Tromsø and business companies of Tromsø gave us the opportunity to create a special collection of polar literature in the BIBSYS database. The generous funding of our project reflects the strong position of polar history and research at the University and in the town. The most important parts of the collections are perhaps the Norwegian and Scandinavian books, which cannot be found in other databases. Through cooperation with other polar libraries in Norway we hope to make the database more complete in the future.

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COLD CLIMATE RELATED STUDIES IN FINLAND AND IN THE KOLA AREA IN RUSSIA: A NEW PRODUCT - BIBLIOGRAPHY AND DATABASE

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Abstract

Today, information on cold climate related studies in Finland is dispersed throughout the country in libraries and research units as lists, gray literature and databases.

The production and development of a new database is a joint effort between the Lapland Provincial Library and the Arctic Centre Data and Information Services Unit to bring this information together.

Research abstracts produced at the Kola Science Centre in Russia are translated by the Data and Information Services Unit from Russian into English. The translations will be merged into this database.

Motto
East is East and West is West, and never
the twain shall meet...
Rudyard Kipling

Lapponica

It was Rudyard Kipling who said: "East is East and West is West, and never the twain shall meet." In defiance of Kipling, we in Rovaniemi have decided to start constructing a bridge between East and West.

"We" in this connection means three information service institutions in Lapland: The University Library, the Arctic Centre and the Provincial Library of Lapland, especially its Lapland department. This joint effort forms the foundation pillar of the bridge on our side.

The Catchment Area Of Lapponica

The work of actively assembling the Lapponica collection began in the 1960's. In fact, there was a small amount of books about Lapland even before that, (in the 1930's and 1940's), but they were destroyed in the war as was the entire town of Rovaniemi. After the war, the work had to be started from scratch.

For the time being, the number of items in the collection is ca. 80,000; out of which ca. 50,000 are monographs, 30,000 are articles and there is a small amount of audiovisual material.

The accession criterion of the Lapponica collection is a geographical one. We collect material concerning northern Scandinavia, the Kola Peninsula and the Spitzbergen. Iceland is excluded but since the 1980's some material on Greenland has been purchased.

Multilingual Lapponica

The material about Lapland has been published in many languages. The early famous travelogues were in Latin, Italian and French.

Nowadays, the bulk of our Lapponica is in Finnish, but ca. half of the collection consists of literature in other languages.

The statistical distribution of the languages represented in Lapponica is as follows:

- in Finnish	50 %
- in the Nordic languages (Swedish, Danish, Norwegian)	28 %
- in Sami	9.5 %
- in English	8 %
- in other languages (German, French, Russian etc; over 20 languages)	4.5 %

The Russian material is quite poorly represented in spite of vigorous efforts made over the years. The language barrier and political and administrative obstacles have been formidable.

We hope that collaboration with the Arctic Centre will open new possibilities for completing the collection.

Special Interests Of Lapponica

In addition to the geographical criterion, some other aspects have been taken into consideration with regard to accessions for Lapponica. The most important ones are:

1. **Sami collection** consists of books in the Sami language and about the Sami people. The size of the collection is ca. 7,000 monographs and 10,000 articles.

2. **Reindeer husbandry;** research and popular material about the reindeer, ca. 5,000 items, of which 12% is in English.

3. **The Laestadian religious movement** was - and still is - a very important cultural feature of Lapland, especially of the Sami people. The size of the collection is ca. 1,200 items.

4. **Christmas** is connected with the mythology of Lapland in Finnish tradition. Our Christmas collection has ca. 1,200 books.

5. **Greenland.** Our library is the centre for Greenlandic literature in Finland. The size of the collection is ca. 1,000 items.

6. **Cold Climate Related Studies.** A joint project between the Arctic Centre and the Provincial Library of Lapland. The aim is to produce a bibliography of cold climate related studies in Finland.

Lapponica - Who Is It For ?

The idea of a large Lapland collection was born after the war when the research work in Lapland was organized. The patron of Lapponica was the Research Society of Lapland whose small library became the core of the collection. The Provincial Library of Lapland takes care of the research exchange of the society even today.

At present Lapponica is used by all kinds of clients ranging from school children to administrative planners. In fact, we have intentionally increased the number of users in Finland by offering it in the electronic form via the KATI-database.

As of the beginning of this year, a new means of access was opened when Lapponica was connected to the library system Aurora. The shortest way to describe Aurora is to call it "Lapland's OCLC". So far, only five municipal libraries have joined it, but the geographical area which the net covers is quite large in Finland.

Negotiations to connect the Aurora system with the Finnish research libraries' Linnea-system are underway. A link between them would open new possibilities for our foreign users.

The other way is to include Lapponica in the next version of the Polar Pac CD-ROM. We do hope that one or the other of these will be realized in the near future.

The Role Of The Arctic Centre's Data And Information Services Unit (AC/DIS) In Collecting Cold Climate Related Studies In Finland And In The Kola Area In Russia

Why A New Product ?

Today information on cold climate related studies in Finland is dispersed and tucked away throughout the country in libraries and research units in the form of lists, gray literature and databases.

It is very difficult to retrieve the relevant references involved in arctic studies in Finland. To find all the relevant information on cold climate related studies in Finland you have to use several Finnish data bases and bibliographies. The retrieval languages in these databases differ from one another.

Now, the newly compiled database makes it possible for the end-users to easily access information on Finnish arctic research.

Who Is The Database Directed At ?

The database will be a multidisciplinary one and mainly directed at researchers interested in cold climate related studies in Finland and the Kola area of Russia.

Contents Of The Database

The production and development of a new product, a new database called "Cold Climate Related Studies", is a joint effort between the Lapland Provincial Library and AC/DIS to bring together the dispersed information on cold climate related studies. Collecting of the data was started in 1990 as the Arctic Centre is quite a new institution. It came into being in the beginning of 1989.

The database "Lapponica" is the basis of this project. The relevant references published in 1990 concerning arctic research in northern Finland have been picked out from "Lapponica".

AC/DIS collected information on research references produced in 1990 in other parts of Finland by research institutes and universities which are recorded **in the database of Arctic Research Institutes compiled by AC/DIS.**

The accession criteria for the collected information depends on the research field and the information in question must be written in Finland or by Finnish researchers. We don't limit the collected information only to studies relating to northern Finland because there are, for example, research reports on ice and snow in eastern Finland. That kind of research is closely connected to cold climate studies. The information collected is then combined to form a new database.

As an example, we have references on road constructions, concrete structures and transportation in cold environments as well as on building in difficult conditions.

In the future, we shall conduct continuous basic references from Lapponica and collect other information from our contact institutes included in the database of Arctic Research Institutes. Information will also be collected directly from the researchers at the same time as we update the database of Finnish Arctic Experts. **The database of Finnish Arctic Experts is compiled at AC/DIS.** You can "jump" from the expert database to the cold climate database to see what kind of articles a particular expert has written and vice versa.

The retrospective information will be merged with the database in the future.

References are mostly in Finnish. To describe the contents of studies, we use much the same English keywords/subject terms as are used in the ASTIS-database (the Arctic Science and Technology Information Systems) and in the list of subject headings produced by the Library of Congress.

Russian Abstracts

The AC/DIS serves as a link between East and West. Research abstracts produced at the Kola Sciences Centre in Russia are translated by AC/DIS from Russian into English and provided with keywords. Translations of research abstracts cover the entire Kola Peninsula.

For example up till now we have translated research abstracts produced by Kola Science Centre concerning "Natural Resources of the Kola North", "Simulation Modelling of Mineral Production", "Economic and Social Aspects of Utilizing the Industrial Potential at the Kola Region".

The translated abstracts will be continuously merged with this database.

Recording To Database Software Minttu

The recording format will be written in English. The format is similar to the Marc format. The retrieval languages are Finnish and English.

The software product Minttu has been developed by VTKK (the Finnish State Computer Centre). Once the AC/DIS databases are ready for online use, they will be installed in the UNIX-environment. Collections of information are stored at the University of Lapland's computer in Rovaniemi.

Users will be able to access the databases through Internet using X.25 or a modem.

In The Future

Just now, we are at the beginning, but we shall continue our work of collecting data on cold climate related studies carried out in Finland and in the Kola Peninsula in Russia.

We aim to make this knowledge of Finnish and Russian origin available worldwide.

COMMUNICATIONS AND DATA BASES IN THE REGIONAL INFORMATION SYSTEM (RIS) OF THE RUSSIAN NORTH

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Abstract

The structure and typical structural approaches are considered for the information system of the Russian North. The system is designed to provide information support for regional research programs both national and international. The system incorporates scientific centres of the Russian Academy of Sciences with the universities of the North. The system is primarily aimed to support the research programs of national exploration of natural resources including programs in energy, economics and ecology, etc.

Introduction

The Regional Information System (RIS) of the Russian North covers the northern territories, including:

- Karelia: the town of Petrozavodsk, Karelian Science Centre and the University of Petrozavodsk;
- Murmansk region: the town of Apatity, Kola Science Centre of the Russian Academy of Sciences, the town of Murmansk, Institutes of Kola Science Centre;
- Komi Republic: the town of Syktyvkar, Komi Science Centre, the University of Syktyvkar;
- Arkhangelsk region: the town of Arkhangelsk, Institutes of Russian Academy of Sciences, several colleges.

The institutions named are the participants of the RIS project and the project itself is incorporated into the program "Informatization of Russia". The project is to provide for the development of a basic RIS structure that makes use of ongoing and incoming databases and communication links. RIS is adapted for the tasks of information support for regional research programs involving exploration of nature and like programs. Such programs have turned out to be urgent as the northern part of the country has become extremely vital as a source of raw materials and energy since the ecological situation in the region has deteriorated. The main aspects for applying RIS are as follows: direct information support of the programs, i.e. remote access to databases, E-mail, remote access to computer resources, data exchange, etc.; regional ecological monitoring of the northern sea-waters; and the development of and research on formation networks with flexible topology. It is obvious that both the basic RIS and its derivatives can be used for information support of various research programs, as well as, commercial tasks.

Communications And Databases Of The Russian North

Regional Information System (RIS) is a complex of personal computers, hardware and software, tools of data collecting, data storing and data processing, as well as remote access to the information. This complex is aimed at information support of the regional research programs. The Regional Communication System (RCS) is an important component in this system. RCS determines the quality of arranging the information systems, especially, that of the real-time access. The State communication systems of the Russian North (such as telephone, telefax, telegraph, and digital data communications) are still very poorly developed, unreliable and overloaded. On the other hand, local geographic and social-economic peculiarities of the region do not provide a basis for considerable development of these systems to meet the requirements of the regional information systems. That's why the problems of developing a new communication system need to be solved. This system will deal with the following problems.

1. Information support of the programs on the basis of designing basic systems and their adaptation to current changes and principally new tasks.

2. Adopting structural, technical and algorithmic solutions of communication systems of Russia to provide an easy input into these systems.

3. Ensuring the means for real-time connection to the international communication systems.

All the peculiarities mentioned above are to be taken into account when using existing and prospective means of communications.

Nowadays there are various databases in the institutions of the Russian North. They cover the fields of geology, ecology, chemistry, regional climate, and forestry, etc. All of these databases are designed and developed on computers of different types, using different operation systems and they are not accessible for remote users. Thus, the main task of RIS is to combine these databases into a unique basic system.

Approaches To Develop Information Systems

Formation of specific problem-oriented systems is one of the main methods to develop information systems. Unfortunately, this method has many disadvantages, namely: expensive equipment is not exploited to its full capacity, inevitable duplication of information and functions in different information systems, difficulties in enlarging the system and its adaptation to new requirements and tasks. The development of complex universal information systems cannot be advocated because it is impossible to formulate the goals for every potential user of RIS at the primary stage of the system design since this might create mal-functioning systems. (Besides, it is not obligatory to connect with a poorly operating subsystem.) Note that the functions of the subsystem, such as data rate, ways of data storage and data access, user's interfaces, may be rather good. But the general "usefulness" of the system turns out to be low. Though the notion "usefulness" is not very formal it should be defined properly and the needs of potential users might be formalized at the very early stages of the system design.

RIS has special mechanisms for connecting with other information systems of higher and lower levels, as well as with existing and prospective databases and computer networks. The mentioned peculiarities support the concept of developing the regional information system as a network of information centres joined with each other and connected with national and international networks. Thus, the regional information centres become the main structural components of such a system. Every centre can focus on one certain problem, for example the task of information support of ecological monitoring over a large territory or, various problems of information support of research for social-economic programs. In this case the databases may be used as structural components of the information centres.

Basic RIS is to operate on the leased telephone line St.-Peterburgh-Petrozavodsk-Apatity, switched telephone lines, stations of the INMARSAT system and its Russian analogue "Horizont". The former tools compose the regional subnet of the national information-computer network named RELCOM. It includes a host-computer of the regional subnet installed in the Institute of Informatics, Kola Science Centre, Apatity. The RELCOM network is connected with international networks through the network EUNET of the European Association of open networks EUROPEN. Though very expensive, satellite communication will be used for reliable real-time information exchange both within the regional information system and with other Russian and foreign systems. Thus, one of the main problems of a structure-algorithm design is to define an exact type and information characteristics of the communication tools and databases.

There are several stages that may be noted in the process of design and performance of the Regional Information System:

1. To determine the information model on the basis of information characteristics of ongoing and incoming tasks operating in the regional programs and attending problems. The uncertainties, which may arise when calculating, can be easily overcome if similar existing systems are applied and estimations of the experts are taken into account. It is necessary to specifically adapt the model to changing tasks when designing, developing or exploitation show a need to do so.

2. To select basic structural, technical and algorithmic solutions for different levels of the system arranging regarding regional, territorial, and social peculiarities of the Northern areas. Economic development, the time period of the design, application,

and a possibility to enlarge the communication system might also be taken into account.

3. To develop several alternative projects to the basic RIS. The projects must be computer estimated, modelled, compared and the one with the best parameters must be chosen. But in this case the task of optimization is hardly possible to be realized because of great uncertainty of the initial data.

4. To realize the basic solutions and insert the necessary corrections into the chosen project according to the results of current developing and testing of the basic solutions. The tools of functional-goal information technology are used as instrumental program tools for developing and support of the regional information system. This is a type of CASE-technology for computer aided-design and it contains computer systematic design for every stage of the project beginning with defining and analyzing the task to be solved by the system.

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CONTRACT INDEXING OF INDUSTRY AND GOVERNMENT GRAY LITERATURE AT ASTIS

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Abstract

Over the past four years the Arctic Science and Technology Information System (ASTIS) has been successful in obtaining funding from several companies and government agencies to pay for the indexing of their gray literature. These contract indexing projects have added report collections on three proposed natural gas pipelines from the Canadian Arctic, and three sets of publications produced or funded by Indian and Northern Affairs Canada, to the ASTIS database. Various aspects of this work are discussed, including "copy indexing", methods for dealing with proprietary reports, and the production for sponsors of printed bibliographies and microcomputer databases.

Introduction

The Arctic Science and Technology Information System (ASTIS) has no core budget from the Arctic Institute of North America (AINA), and is mandated to rely on external funding in order to be as self-sufficient as possible. This philosophy is consistent with that of AINA itself, which has only a small core budget from the University of Calgary and relies on external funding for approximately 80% of its revenues. AINA is usually able to cover small shortfalls in ASTIS revenues, and large shortfalls are prevented by reductions in staff hours or by staff layoffs. In the fiscal ended March 1992 ASTIS had a small surplus and required no funding from AINA. In the previous fiscal year ASTIS required a 6% subsidy from AINA.

Because of its reliance on external funding the focus of ASTIS has changed over the years to reflect the needs of funding agencies. In its early years ASTIS was largely funded by the oil and gas industry to provide current coverage of general Canadian Arctic literature. We were able to scan over two hundred serial titles and the monograph acquisitions of the University of Calgary Library and index all relevant material that we found. During the mid nineteen-eighties the industry-funded Environmental Studies Research Funds became the major source of ASTIS revenue, resulting in a reduction in our general indexing in favour of the specific ESRF subject areas for which ASTIS was preparing bibliographies.

The late eighties and early nineties saw a reduction in industry interest in the North, and further changes for ASTIS. Grant revenues from industry declined sharply, and, of necessity, contract indexing grew from a relatively small part of the project's revenues to one of its major sources of funding. General or non-contract indexing, on the other hand, had to be reduced to a low level. While ASTIS regretted this reduction in its coverage of current and general northern literature, we at least had the satisfaction of knowing that the material that we were adding to he database was important enough that someone was willing to pay to have it indexed.

The purpose of this short paper is to describe six contract indexing projects undertaken by ASTIS between 1988 and 1991. Searchers of the database may find it useful to know what new collections of information have been added to ASTIS, and producers of other databases may get ideas for contract indexing projects that they can undertake. In addition to the fact that they were all done on contract, the projects described below have in common the fact that many of the documents indexed under them were gray literature. For the purposes of this paper gray literature is defined as literature with limited distribution, such as most industry and government reports as well as papers given at small regional conferences. Another way of describing such literature would be to say that it includes anything that is unlikely to be picked up by the major discipline-oriented databases.

The organizations that funded these indexing contracts had one, or both, of the following motives. One motive was to make their information more widely available. In the case of government agencies this helped to ensure that information produced at the taxpayers' expense had the widest possible use. In the case of companies it helped to improve awareness of the amount of research, both technical and environmental, done in preparation for northern pipeline projects, and to demonstrate good corporate citizenship. A second motive was the deliverable products from the contract. By making use of ASTIS' expertise and software, as well as the bibliographic records that were already in the ASTIS database, clients could obtain a camera-ready printed bibliography or a microcomputer database at a lower cost than in-house production would require.

Total ASTIS revenue from the contact indexing projects described in this paper was approximately $135,000. In some cases the work was done for a negotiated fixed price, while in others it included both a fixed price component and a price per document. The per document price during the period covered by these contracts was $40, but that price has since been raised to $50.

Northern Affairs Program Bibliography

The first in this series of six contract indexing projects was sponsored by the Circumpolar and Scientific Affairs Directorate of Indian and Northern Affairs Canada in 1988. The purpose of the work was to ensure that the most recent twelve years of publications from the Department's Northern Affairs Program were in ASTIS. This was accomplished by working from the publication *Bibliographical Listing of Studies Conducted or Supported by the*

Northern Affairs Program, Department of Indian Affairs and Northern Development 1973-1984 (ONRSA, 1985).

Because ASTIS often produces special bibliographies for clients, and because it is not always possible to physically examine every document that must be included in such bibliographies, ASTIS will, with permission, copy citations and abstracts from other bibliographic sources. To warn our users that citations copied in this way may not be up to ASTIS' usual indexing standards, a Citation Source field in ASTIS records generates a note of the form "Document not seen by ASTIS. Citation from..." whenever we have not examined the actual document ourselves. This form of "copy indexing" was used for the many citations from he Northern Affairs Program bibliography that could not easily be verified in the AINA or University of Calgary collections.

The work on this project consisted of examining the 904 apparent citations in the bibliography, eliminating 312 duplicates, searching for the remaining 592 citations in ASTIS and eliminating the 259 citations that were found, eliminating a further 37 citations that were too incomplete to index, and indexing the remaining 296 citations for our database.

Northern Scientific Training Program Bibliographies

The Northern Scientific Training Program (NSTP), funded by the Circumpolar and Scientific Affairs Directorate (CSAD) of Indian an Northern Affairs Canada, provides small grants to graduate students doing research in northern Canada. Universities are required to report to CSAD all publications from NSTP-supported research, which CSAD lists in an annual bibliography (CSAD,1991). Through a series of small contracts between 1988 and 1991, the 1983 through 1990 volumes of this bibliography were added to ASTIS.

The work on the project used a process similar to the one described above for the Northern Affairs Program bibliography. Citations that were already in ASTIS or that were too incomplete to index were eliminated, and the remaining citations were added to ASTIS using "copy indexing" where necessary. The eight volumes of the NSTP bibliography processed thus far have yielded a total of 1275 new records for ASTIS, and have significantly improved the database's coverage of recent northern research at Canadian universities.

Polar Gas Pipeline Reports

In 1990 the Polar Gas Project (now the Polar Delta Project) donated a collection of 816 industry reports to AINA. Polar Gas had originally proposed to build a gas pipeline up the west side of Hudson Bay to the Canadian Arctic Islands, but was in the process of re-orienting its efforts towards a Mackenzie Valley gas pipeline. Polar Gas agreed to pay for the indexing of those reports in this collection that were produced by or for the company, and for the production of a bibliography combining those reports with Polar Gas reports already in ASTIS.

The project involved the enhancement of 125 reports already in the ASTIS database, and the indexing of 256 reports from the donated collection. These were combined in a printed bibliography using one of the standard ASTIS bibliography formats, with the main section providing access by author and four indexes providing subject, geographic, title and serial access. Ten copies of this bibliography were provided to Polar Gas for the use of its staff.

Canadian Arctic Gas Pipeline Reports

The library of Canadian Arctic Gas Study Limited (CAGSL), a company formed in the early 1970s to research a Mackenzie Valley gas pipeline route, was donated to AINA in 1979. As a condition of the donation a collection of approximately 2200 reports, out of a much larger library, was required to be held confidential for the use of the companies that had invested tens of millions of dollars in the CAGSL research. A revival of interest in a Mackenzie Valley gas pipeline led to a 1990 contract to ASTIS from Esso Resources Canada, the legal heir of CAGSL, to prepare a database of these proprietary reports.

There were two reasons why ASTIS agreed to put a great deal of effort into the preparation of records that could not be entered into its public database. We needed the money to keep our staff employed, and Esso assured us that once a consortium had been formed to apply for the right to build the pipeline the reports would be made public. (Esso had little concern about the "public" seeing the reports, only about certain competitors seeing them. With the formation of a consortium these competitors would become Esso's partners.)

Esso wanted to be able to distribute searchable copies of the CAGSL database easily and cheaply to many people. On advice from ASTIS the Folio Views retrieval package was chosen. Folio Views is a fast full-text retrieval package that compresses files to approximately one-half their original size during indexing, that will run on minimal PC-compatible computers, and that allows run-time versions of the retrieval software to be freely distributed. ASTIS prepared bibliographic records in a format that could be converted for input into either Folio Views or the ASTIS database.

Esso did not wish to pay for full ASTIS indexing of the entire proprietary collection. Esso staff selected approximately one-half of the collection for full indexing, and the remainder was included in the database with titles and call numbers only. While selecting reports Esso staff also divided them into approximately 50 subject categories, which were used to subdivide the database into "chapters". The resulting database contained 170 existing ASTIS records, 244 new records that were added to the public ASTIS database (including all the environmental and socio-economic reports indexed), 656 new proprietary records, and 1113 records with titles and call numbers only.

In April 1992 Esso agreed to let ASTIS add the 656 proprietary records to the public ASTIS database. The corresponding reports have not yet been made public, so each ASTIS record mentions that permission from Esso is required to use the report. The reports are currently housed at ASTIS, and Esso has been quite reasonable about letting researchers use them.

Maple Leaf Pipeline Reports

In 1991 ASTIS received a contract from Foothills Pipe Lines to prepare a database of research reports concerning Foothill's Maple Leaf Pipeline proposal, another 1970s Mackenzie Valley gas pipeline alternative. This project was similar to the Arctic Gas indexing project described above, except much smaller. The resulting Folio Views database contained 5 existing ASTIS records, 19 new records that were added to the public ASTIS database and 62 new proprietary records.

Northern Oil and Gas Action Program Bibliographies

The Northern Oil and Gas Action Program (NOGAP) is a research and planning program designed to advance the state of federal and territorial government preparedness for major hydrocarbon development in the Yukon and Northwest Territories. The program is managed by the NOGAP Secretariat in the Constitutional Development and Strategic Planning Branch of Indian and Northern Affairs Canada, and funds research that is undertaken by many federal and territorial government departments. Prior to 1991 NOGAP had published three bibliographies of research reports funded by the program, the contents of which had, with NOGAP's permission, been added to ASTIS.

In 1991 ASTIS received a contract from NOGAP to produce Volume 4 of the *NOGAP Bibliography* (NOGAP, 1992), a *NOGAP Cumulative Bibliography* (NOGAP, 1992), and two microcomputer databases of the cumulation. The 256 existing ASTIS records from Volumes 1-3 were enhanced to include NOGAP project numbers. 139 new records were indexed for Volume 4, using our normal indexing methods when the department involved was able to supply NOGAP with the report and "copy indexing" when they could only supply a citation and abstract.

NOGAP was supplied with camera-ready copy for Volume 4 and the cumulative bibliography using a standard ASTIS format in which the main sections of the two bibliographies were sorted by broad subject category and five indexes provided subject, geographic , author, title and serial access. The 395-record cumulative database was supplied in Folio Views format for PC-compatible computers and in FileMaker format for the Macintosh.

Summary

The following table summarizes the six indexing projects described in this paper. The "% Gray" column contains a rough estimate of the percentage of the documents indexed that were gray literature, as defined earlier. The next column lists the number of records, already in ASTIS at the start of the project, that were enhanced in some way for inclusion in a deliverable product. The next column lists the number of records added to the public ASTIS database during the project. The second to the last column lists the number of records created during the project solely for use in a proprietary database. The last column lists any deliverable products.

Indexing Project	%Gray	Existing Records Enhanced	New Public Records	New Proprietary Records	Products
NAP Bibliography	98%	0	296	0	
NSTP Bibliographies	25%	0	1275	0	
Polar Gas Pipeline	99%	125	256	0	Bibliography
Arctic Gas Pipeline	99%	170	244	656	Database
Maple Leaf Pipeline	99%	5	19	62	Database
NOGAP Bibliographies	95%	256	139	0	Bibliographies, Databases
Total		556	2229	718	

Perhaps an appropriate way to end this paper would be to mention that there are many gray literature contract indexing projects for which we have so far been unsuccessful in finding funding. These include a collection of 3300 documents donated to AINA by the federal Polar Continental Shelf Project, the one-half of the Arctic Gas proprietary report collection that was not indexed under our contract from Esso, the two-thirds of the Polar Gas donation that was not indexed under our contract from Polar Gas, and the donated collections of several other northern oil and gas projects in the AINA Collection's infamous "Pipeline Room". Some day all of this information will be in ASTIS, or, hopefully, a Canadian Polar Information System.

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PERMAFROST INFORMATION AND DATA MANAGEMENT ACTIVITIES OF THE NATIONAL SNOW AND ICE DATA CENTER

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Abstract

Permafrost underlies at least 25 million km^2 of the Earth's surface. Permafrost, ground freezing and frost heave pose major geotechnical problems for exploration and development in northern areas. Consequently, the subject is of considerable interest to scientists, engineers and planners working in these cold environments. The topics of permafrost, ground ice, frozen soil and geocryology are formally within the scope of interest for the National Snow and Ice Data Center (NSIDC)/World Data Center A for Glaciology (WDC).

In 1983, in conjunction with the International Permafrost Association and the U.S. Army Cold Regions Research and Engineering Laboratory, NSIDC/WDC published the first in a series of permafrost bibliographies. The third in this series is now in preparation.

Permafrost is a thermal condition of the Earth's mantle and consequently is extremely sensitive to changes in climate. Because of the need for multi-disciplinary data sets to support global change research, NSIDC/WDC is beginning a program to inventory and/or collect permafrost data sets in addition to the sea ice, snow cover, remote sensing data (Defense Meteorological Satellite Program [DMSP], and passive microwave, etc.) and various other data already held. This paper will give a brief account of our work with the permafrost bibliographies and discuss our future data management plans for permafrost data.

Introduction

Permafrost is defined as 'perennially frozen ground, occurring wherever the temperature remains below 0°C for several years, whether the ground is actually consolidated with ice or not and regardless of the nature of rock and soil particles of which the earth is composed'. Permafrost underlies at least 25 million km^2 of the Earth's surface; 'it is continuous in the polar regions and becomes discontinuous and sporadic toward the Equator' (Black, 1982). See Figure 1.

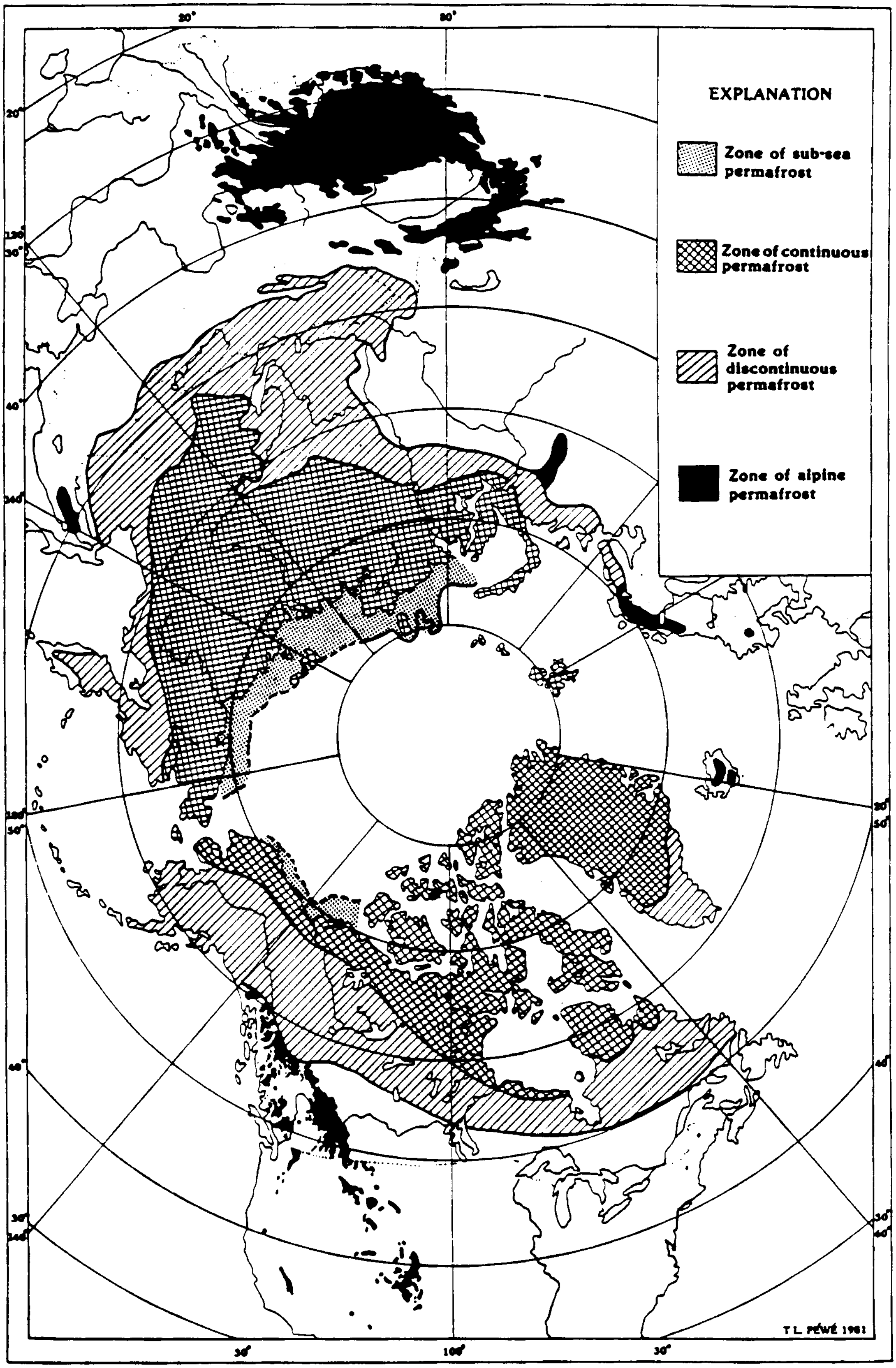

Figure 1. Distribution of permafrost in the Northern Hemisphere. (From Péwé, 1983.)

Bibliographic Activities

The mandate of the World Data Center System has always included the collection, storage and dissemination of information and data on 'seasonal and perennial ice in the ground' (ICSU, 1987) as one of its main elements. However, because of the institutional location and research focus of the WDC scientists, it was not until 1982 that the World Data Center A for Glaciology began an active program in the area of permafrost and frozen ground research. In that year, at the urging of Dr. Jerry Brown, then at the Cold Regions Research and Engineering Laboratory (CRREL), Hanover, NH, and with the financial support of CRREL and bibliographic assistance of Geza Thuronyi, Natalie Voshinin, and Tatiana Zelensky of the Cold Regions Bibliography Project at the Library of Congress, we began the compilation of a permafrost bibliography. This bibliography, covering the period 1978-1983, was prepared in conjunction with the Fourth International Conference on Permafrost held in Fairbanks, Alaska, in July of 1983, and published in our *Glaciological Data* series (Brennan, 1983). The volume had author and subject access and included more than 4400 entries from a variety of sources. The International Permafrost Conferences meet every five years, and in 1988, we updated the Bibliography for the period 1983-1987 (Brennan, 1988); approximately 3300 citations were added. We again will be supplementing the Bibliography in 1993 in conjunction with the VI International Conference which will be held in Beijing.

Because the compilation of the Bibliography was time consuming, we focused on finding new references and never really stopped to analyze the sources of the information. When preparing this discussion, I thought it might be useful to have a look at some of the sources in more detail and compare them. The "Arctic and Antarctic Regions" CD-ROM from Fred Dürr of the NISC Corporation and Georef on disc made this task possible and relatively simple. Because of the volume of permafrost information, I chose one year, 1989, to compare the data on the various files on the Arctic and Antarctic Regions disc with each other and with Georef; 1989 seemed to be the most recent year that I could expect to be reasonably completely indexed. The search terms used were 'permafrost*' or 'frozen ground' in the Keyword field. Table 1 gives an overview of what was found. Column 1 is the Database name; column 2 is the number of citations found using only the Keywork field and then using the Global search feature; column 3 lists the number of citations found only in a particular database and as a % of the total 'permafrost' entries for the database; the last column, COMPARISON, shows the duplication by database.

The significance of how the indexing is done clearly shows in the discrepancies found in numbers retrieved when using a global search, not just keywords, in the SPRI and ASTIS databases. Twice as many records turned up on the Global as on the Keyword search. There are, of course, implications for shared cataloging projects because of this difference in indexing philosophy/approach, but that is a topic for discussion elsewhere. The overlap numbers shown might require some adjustments because of the method I used to make the comparisons between the databases. Using a printed copy of the search, say for CRREL, I then went to the Arctic and Antarctic Regions disc by author, noting which other databases also held the citation. The first difficulty was with the transliteration and format of Russian

Table 1

PERMAFROST* OR FROZEN GROUND 1989					
DATABASE	# OF CITATIONS KW	GLOBAL	UNIQUE	%	COMPARISON
ASTIS	8	14		6	
CRREL	301	312	172	57	ASTIS-4 C-CORE-3 SPRI-118 WDC-49
SPRI	218	467	67	31	ASTIS-4 C-CORE-3 CRREL-147 WDC-50
WDC	51	53	7	14	ASTIS-4 CRREL-40 SPRI-40
GEOREF	134		45	34	ASTIS-4 C-CORE-3 CRREL-67 SPRI-67 WDC-16

and Chinese names. For example, in SPRI, Chinese names are rendered in the Chinese style, Chou Wanxi, without punctuation; CRREL writes the name Chou, W.X. Because of the difference in punctuation, even a truncated search does not retrieve both cases in the same search. In Russian transliteration, Ershov, in the CRREL style becomes Yershov in SPRI. These again are just asides from my main focus, but they indicate items that will need resolution in share cataloging discussions. In several instances, I noticed that a Keyword search would not have picked up the reference in a particular database. This seems to indicate that cataloging and indexing are still creative tasks and that an intimate knowledge of a database is required to retrieve the absolute maximum number of citations. However, I tend to be a member of the 'less is more' school of thought on searching and I do not find this to be a particular problem. When searching for a user, if one has chosen the database carefully, the references retrieved will almost always be adequate to the researcher's needs. Only when attempting a definitive bibliography or preparing a Ph.D. dissertation does one need to find EVERYTHING.

Our experience at attempting to compile a comprehensive bibliography on permafrost/frozen ground has shown that none of the Polar bibliographies is complete. For this reason, we think that the publication of the Permafrost Bibliography on CD-ROM would be useful to the research community. We intend to continue our five-year cumulations, the next in 1993. Our plans also include publication of a 15-year cumulation, 1978-1992, on CD-ROM along with an inventory of permafrost data sources and samples or, in some cases, complete data sets.

Data-Related Activities

The vast extent of the published literature is illustrative of the potential magnitude of the related data sets. Measurements range from field observations of permafrost-related features, to surface and borehole data on physical properties of frozen ground and geophysical surveys, and laboratory experiments or tests. Remote sensing is now adding new types of data on frozen ground conditions.

Planning for new international activities such as the International Geosphere-Biosphere Programme (IGBP) calls for monitoring global change in areas sensitive to climatic or anthropogenic disturbances. The sensitivity of permafrost conditions to such changes is well recognized. These IGBP requirements imply a need to develop integrated global archives of permafrost-related variables suitable for use in multi-disciplinary research. In August 1988, in conjunction with the V International Conference on Permafrost, the World Data Center A for Glaciology organized a Workshop on Permafrost Data and Information to assess the current status of bibliographic and numerical databases. One of the Recommendations resulting from that Workshop was the establishment of data directories with interactive remote access and cross-referenced guidance to permafrost-related data and information (Brennan and Barry, 1988).

The inventory, our current project relating to permafrost, is a follow-on to that Recommendation and a move from our strictly bibliographic-related activity. Earlier this year, a letter and very brief questionnaire were sent to members of the permafrost community worldwide. Names were selected from the International Permafrost Association mailing list and the attendees of the V International Permafrost Conference held in Trondheim, Norway, in 1988.

The questionnaire was quite simple, just 4 basic questions:

1. Do you have data?
2. What is it?
   Analog or digital?
   Type - thickness, ground temperature, etc.?
   Geographic area?
   Time period?
3. Would you be willing to make the data available through a coordination/referral office?
4. Would you be interested in publishing the data on CD-ROM?

We mailed about 310 letters in mid-February; to date, mid-April, we have received 76 responses (about 25%) from 13 countries (Argentina, Canada, China, Denmark, Germany, Japan, the Netherlands, Norway, Poland, Sweden, Switzerland, the UK, and the USA). Of these respondents, 49 hold data; 37 would be willing to make their data available through a coordination office and 30 would be interested in publishing their data. Funds to make the data ready for distribution are often a question, but the willingness to make it available is the important first step in the process.

What is next? We will continue to add names to the Permafrost Inventory mailing list. One of the questions asked for referrals to other holders of data. We will follow up on those. Then we plan to use the information on the first questionnaire to set up a simple database where information will be available by investigator, institution, data type and geographic area covered. Eventually, we hope to have sufficient information about these data sets to make them available to the Global Change Master Directory and the Arctic Environmental Data Directory. The final step in this initial phase will be to select data sets which might be appropriate to include on a sample CD-ROM.

I hope that by the next Colloquy in 1994 that I will have a completed Permafrost CD with both Bibliography and Inventory to demonstrate for you.

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PRINCIPLES FOR LAYING AN ECOLOGY MONITORING REGIONAL INFORMATION SYSTEM

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Abstract

Study of the ecological situation on the Kola North and main reasons stipulating the negative ecological consequences are given. Approaches and requirements to the creation of the regional ecological information system are discussed. Examples for the solution of a number of tasks of the system under elaboration are presented.

It is quite obvious that the global ecological processes are made up of local and regional situations. That is why the objective information about the environment quality in potentially endangered regions is required for the elaboration of an effective nature protection strategy. The northern regions of Russia: Norilsk, the Taymyr, Yamal and Kola Peninsula cause in this connection the greatest alarm. In these regions the ecosystems are at the equilibrium limit, an anthropogenic stress here can provoke irreversible changes in the nature balance. The absence of the unified ecological policy concerning the Kola North territory with its characteristic instability of natural systems has given rise to negative ecological consequences, the main causes of which are:

- the exhaustion of renewed vegetable resources and, as a consequence, the weakening of the forests' environment - stabilizing function;

- the alteration and disruption of natural landscapes, which results in the loss of useful properties and resources of the territory;

- the regional pollution of air and waters, which is expanding with aerial streams into the surrounding undamaged territories;

- transcontinental and transborder streams of pollutants, which concentrate in the Arctic and Subarctic regions, reduce the biological productivity of Northern Seas and result in the dying out of sea animals and birds.

The main causes of the present-day ecological situation in the Kola Peninsula are the following:

1. The existing structure of the industry, directed toward the mining and the initial treatment of mineral raw materials.

2. The high concentration of productive forces on a restricted territory (mainly the central part of the Kola Peninsula).

3. The low scientific and technical as well as the technological manufacture level, i.e., the outdated technologies, the influx of an unskilled labor force, the concentration of population at the industrial units and the increase of anthropogenic load.

4. The separated planning and management of economic, social and ecological processes.

5. The low level of common culture, of ecological education, of upbringing and behavior.

6. The underestimation of the acuteness of the present ecological situation and its negative tendencies.

7. The extremely insufficient, doubtful and difficult to compare information on the environment quality.

It follows from this enumeration that the laying of ecological monitoring information systems is one of the actual and pressing problems.

The Kola peninsula is the most suitable object as a proving ground for elaboration of such systems according to the following circumstances:

- the naturally limited size of the region and northern ecosystems, which are unique;

- the acuteness of ecological problems;

- the location of this region near the border and the interest of Scandinavian countries in the realization of the program.

The last circumstance is especially important because of the perspective under consideration - the laying of a common information system of Scandinavian countries.

In the Murmansk region observations are performed by different departments and this is the cause of the absence of a common and complex Environment condition control system.

Moreover, an obstacle to the qualified solution of ecological problems are data, difficult to access, because of no unification in their keeping and transmission, as well as the departmental disconnection.

The consequence is the absence of a region's ecological situation integral picture, reflecting the complicated interconnections between the ecosystem's components as well as the resulting influence of the environment condition upon human health.

The solution of this problem is possible in the case of elaboration and realization of an ecological information system, including a computerized control net, data bases and mathematical models of environment condition forecast and management.

The aim of the ecological program is to provide the administration and the population of the Murmansk region and neighboring territories with complete and exact data necessary for the planning of further economic development of the region.

The purposes of the eco-inform-system are:

- the structure forming for collection, keeping and accumulation of the information on the Kola North environment condition;

- laying of an automated control of the region's pollution level;

- forecast of the environment elements changes owing to the ongoing industrial development of the region, the reconstruction of enterprises being in action and the planning of new technologies;

- evaluation of the economic damage to man and nature already caused or prevented, determination of the abnormally working objects - the culprits of the pollution, the ecological examination;

- organization of a base on ecology and technologies knowledge aiming the perfection - in a regime of studies - of the professional level of the experts.

The elaboration of the system is being performed on the base of home - and world-wide experience of investigations in this field, of the available standard mathematical system - and applied software, as well as the update hardware support; the compatibility of the system with Scandinavian eco-inform-systems should be provided.

The system is an open one, it foresees the engagement of new technologies and software as well as a step by step expansion of the problems range being solved. The technical and software means worked out is constructed according to a module principle. The consumers' interaction with the system is implemented in collective use conditions and provides the connection with other systems and subsystems.

The structure of the region's environmental parameters is under the control of the inform-system.

This system contains:

- the prognostic mathematical patterns of the environment elements;
- the data base;
- the knowledge base;
- the system support of the complexes functioning;
- the automatized systems of surface and distant environmental control;
- the computer and manipulation complex with communication channels.

The software facilities represent a set of functional and system programs, which ensure the whole system's functioning and which work under the standard system's control.

The general functioning software inflation of the system is accomplished by creating a set of mathematical models of several levels:

- the various space-and-time scales' hydro-thermodynamic models of the atmosphere and water-bodies dynamics;
- the models of pollutants emissions diffusion into the environment and of the admixtures components transformation;
- the investigation machinery of systems' sensibility to the models input parameters disturbances;
- the ecological models describing the anthropogenic influence on nature and man;
- the optimization models of nature-protection arrangements planning with restrictions of sanitary, ecological and economic character;
- models of data assimilation in the environment monitoring systems and the region's environment protection data bank arrangement;
- the simulation models, the knowledge bases on ecological situation diagnosis and on selection of technologies.

Within the bounds of the problem being considered a number of tasks have already been solved. The general architecture and the system support (AKC/INFO), compatible with the international ecological information systems, have been chosen. The conception, tasks and structure of a Sector Centre for the North within the limits of GRID system have been elaborated.

On the basis of the worked out system of local atmospheric pollution automatized control modelling the assessment was accomplished and mapping fulfilled of the air pollution in the "Pechenganickel" and "Severonickel" companies regions. The forecast mapping was carried out of Russian and Norwegian territories' air pollution levels, providing different versions of "Pechenganickel" company reconstruction (according to Vannikov and Outokumpu Company technologies).

A complex pattern for the radiation consequences was designed using a hypothetical accident involving the Kola Nuclear Power Station and included the evaluation of various accident scenarios. The accident scenarios included the following: the calculation of the atmospheric dynamics under complicated conditions of orography, radionuclides atmospheric transfer, the estimation of dose-loads on human organs and soils surface contamination.

The pattern was verified using the data from the Chernobyl accident; the radiation situation (using the data from the Kola Station hypothetical accident) was evaluated for a 30 - kilometers zone.

This paper reflects the results of the first stage of an investigation, which will be continued.

WLN AND *POLARPAC*

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I want to thank you all for inviting me to Columbus, Ohio today to participate in the Polar Colloquy. I was struck by the congruity of interest which the colloquy members have with WLN: all of us share strong interest in helping libraries communicate with each other and share resources, special skills, and knowledge. So it seems eminently logical that WLN and many Colloquy participants have found common cause in the PolarPac catalog. My purpose here today is to describe what WLN is, some of its history, activities associated with enhancing PolarPac, and most importantly to pay attention to your suggestions about how to make future additions of PolarPac more useful to you and the people which you serve.

What is WLN?

WLN is a not-for-profit corporation located in Olympia, Washington, USA. We are 16 years old this year and I am often asked what WLN stands for. Aside from answering "goodness, truth and beauty", I have to say that the current meaning of the initials is somewhat obscure. WLN stood originally for the Washington Library Network when the organization was a unit of the Washington State Library's operation. Somewhat later, it became the Western Library Network, reflecting its interest in providing services to a much larger geographic area, including parts of the Pacific Rim, Europe and Africa. To take advantage of our historical name recognition, WLN is, as far as the profession is concerned, just a set of initials. (But secretly, staff calls it the "Wonderful Library Network".) We are geographically independent and our mission is to remain an innovative organization with a global perspective, specializing in high quality information-based products and services to institutions and individuals.

Since our primary constituency is libraries, we emphasize our goal of helping librarians to increase their own productivity and save the time of the users of their libraries by the adept application of appropriate technology.

Generally speaking, our focus is to develop and provide services which few institutions could do alone since they may require very specialized technical knowledge and pooling of resources to develop. We also attempt to integrate each succeeding product or service with those which have gone before, as well as add new value for our users.

Technology

WLN generally integrates three kinds of technologies: database manipulation, telecommunications, and software for both mainframe and micro-computers.

Database

The WLN database is composed of over 7.8 million bibliographic records which reflect over 17 million holdings of several hundred libraries in the Pacific Northwest. Since the database also includes the machine-readable records representing holdings in the Library of Congress, as well as other national sources, the use of the database for cataloging, interlibrary loan, acquisitions, and other library functions has great value outside of the Pacific Northwest.

We expect to add databases in the areas of business, education and general reference information from third party commercial suppliers within the next few months. These database enhancements will be followed by full-text retrieval and document delivery as soon thereafter as possible. We are also beginning an experiment with scanning, recording and retrieving records from media other than text: pictures, sound, and motion.

Communications

Libraries generally access the database and derive several products and services from it through a dedicated leased-line network which spans the Pacific Northwestern United States and British Columbia. We also offer dial access. In August 1992 WLN's databases will be available worldwide over the Internet with a brand new user friendly front end called Easy Access. This means that anyone in this room who has access to the Internet can search the WLN database as well as the records related to cold regions or polar information, as well as using PolarPac locally.

Software

For many years the software which operates the mainframe system and its network was licensed to several libraries . This program makes us a unique supplier of information processing software. Such licensees reside not only in the United States, but Britain, Australia, New Zealand, Singapore and elsewhere. We have, however, discontinued our mainframe licensing program to other sites.

Additional software has been developed to operate PolarPac, but PolarPac itself is a derivative of a more generic product which we offer called LaserCat. LaserCat contains about half of the WLN database on CD-ROM, and is searchable on IBM compatible PC machines. The search software for that product is, as yet, not licensed to other sites except as it relates to databases which we maintain. We expect to expand that software into a "graphical user interface" (GUI) environment, as well as to add flexibility for interlibrary loan and dialing-up other database resources. Other products which rely on the LaserCat software in addition to PolarPac include PULSe (the Pacific Northwest Union List of Serials) and various library catalogs such as the New Mexico Union List of Serials.

A third micro-computer activity is the WLN Conspectus software which has its own licensing program. This software allows libraries to analyze their collections either by using existing machine-readable cataloging data or by collecting the data manually from their collections. This product helps libraries to produce rather elaborate and customized displays about how their collection policy actually matches their collections. It is used widely and assists libraries to cooperate with one another by identifying areas of strengths and weaknesses, thereby providing management information to back-up cooperative collection development decisions.

Allied with that software product is a complementary mainframe service which analyzes the holdings of libraries to determine strengths and weaknesses, as well as, to produce reports which display, for instance, the relative number of items received over a particular span of years by imprint date. The University of Alaska/Fairbanks contributed to this development, producing a profile of their own collection which they found quite useful to inform their administration at budget time.

PolarPac

PolarPac is, as most of you know, a CD-ROM which contains several thousand bibliographic records representing the holdings of 34 important institutions worldwide. The second edition was published in December 1991 and contains not just bibliographic records of monographs, but also journal citations and newspaper clipping information. The total quantity of records in the second edition was about 199,000. This represented 135% increase over the first edition produced a year before. The Bibliography of Alaskana is also included in PolarPac, but is not resident in the WLN mainframe database. A special collection of over 13,500 records and newspaper clippings were gleaned from the Oil Spill Public Information Center from Prince William Sound in Alaska. This Center was founded as of a result of the major oil spill which occurred there a few years ago.

We expect to produce another edition of PolarPac early in 1993. The frequency of publication is determined largely by the number of records that are voluntarily added to the PolarPac database since the previous publication.

University of Alaska/Fairbanks and WLN are cooperating on a project to convert Universal Decimal Classification (UDC) numbers into Library of Congress Subject Headings (LCSH) so that records from Britain and other European countries can be posted in the database with common access vocabularies. The UDC project is being done on behalf of the Scott Polar Research Institute in Cambridge, England.

I have been asked about how much storage space is left on the PolarPac CD for expansion of the database. A CD can hold a million records using our compression technique and we are not one-third full yet.

The analysis of distribution of the second edition as of May 1992 shows that sales to countries other than the U.S. include Australia, Canada, Denmark, England, Finland, Germany, Iceland, Norway, Sweden, Switzerland and Iceland. Sales within the United States are to Alaska, California, Colorado, New Hampshire, New York, Ohio, Rhode Island, Texas and the state of Washington.

In conclusion, I have brought along brochures about PolarPac, LaserCat and other products and services which I discussed briefly in my remarks. We would be delighted provide additional information about potential cooperative projects which you might be interested in by phone, mail, Fax, or Internet. Once again thank you very much for your invitation and I wish you and the Colloquy well.

TECHNOLOGY HELPING TO PRESERVE & ACCESS ORAL RECORDINGS

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In 1984, I had the pleasure of attending the Tenth Northern Libraries Colloquy in St. John's Newfoundland. At that meeting, I made the point that, with limited resources, we ought to be collecting less oral history and curating more. Since then, I have become even more convinced of this point and have tried to redirect the limited resources of my office to that end. I have even gone as far as to declare publicly that it is a disservice to the old timers that we have recorded not to devote more of our energies to preservation and use of their recordings. Unfortunately, it is far easier to get money to do new recordings than to take care of existing collections. Realizing this we continue to write research grants but, we have tried to include processing, and a new and experimental way of preservation called digitization. Thus, digitization is the subject of this paper.

With an initial equipment grant of about $30,000 from the Apple Library of Tomorrow Program, we began two years ago to experiment with digitizing analog tapes into the computer to better preserve and access the recordings. I turned to this technology because I could see how recordings in this system would require less care and attention than analog tapes which need to be handled individually each time a researcher wishes to review them. We have adopted the name "Jukebox" which is actually used in the computer industry to refer to automated compact disc servers. Of course, it also conjures up childhood images of the Wurlitzers which gave us automated access to our favorite tunes.

Felix Vogt did the feasibility study for this project as a Master's paper in Engineering Management. Dan Grahek, a recent Computer Science graduate has done the lion's share of the programming and design work. Mary Larson, an anthropology graduate student, designed the North Slope Borough Project. Steve Smith, the library's Computer Systems Specialist has been a primary source of support, particularly in coordinating with Apple personnel. His involvement also assures that our development is coordinated with the growth of the library's local area network.

Project "Jukebox" was designed to digitize recordings into a computer, scan in associated text, maps, and photographs, and program the system to search by key word. This produces a comparative record on topics, people, and places. Researchers use key words to access specific portions of interviews. They can then easily compare the personal perspectives to determine the different ways individuals remember, think about, and discuss historical/cultural issues.

We are developing "Jukebox" applications for the National Park Service, the North Slope Borough, and the Fairbanks Native Association. We also plan to develop a "Jukebox" for the Tanana I.R.A. Council (Tanana Village Native Council). We have two major proposals pending; one with the National Science Foundation, Office of Polar Programs, and one with the U.S. Department of Education, Office of Educational Research and Improvement. The National Park Service (NPS) and the Fairbanks Native Association (FNA) research calls for new recordings, but the Tanana project and the proposals to NSF and U.S.D.O.E. are for preservation and access work with our existing collections--specifically with Native American materials: The Alaska Native Review Commission hearings (circa 356), The Native Elders in Residence recordings (250), the Cy Peck "Chiefs" radio shows (43), and the Chief Peter John recordings (11). This amounts to about 660 hours. Some of these are accompanied by transcripts, summaries, and other supporting materials which we will also scan into the computer. These two proposals also call for generation of Western Library Network (WLN) records so the international Polar research community can see which materials are available.

These recordings were selected because of their importance, because they represent different types of oral history documentation, and because they represent different parts of the state. Taken as a whole, they are a fine reference for students of Native culture in rural and urban parts of the state. In "Jukebox", I expect that they will be used extensively.

It may seem inappropriate that my criteria for choice would contain fairly recent recordings; these are certainly not the most endangered. I made a tactical decision to begin our preservation efforts with the most important, the most discrete, the most adoptable to "Jukebox", and what I predict will be the most useful recordings for students and other scholars. In short, these collections enabled me to build the most convincing arguments about their value for scholarship. I also tried to point out the particular research questions they address. If this strategy is successful then I will expand out from the Native American holdings to political and pioneer collections.

The "Jukebox" format is similar to the work reported on this morning by Denise Wiltshire in that different types of information are indexed into the computer and are searchable in multiple ways. "Jukebox" concentrates on audio but integrates the oral with text, maps, and photo images into an interactive comparative database. "Jukebox" is designed so users can "call up" multiple recordings on any given topic, person, or place. Tapes, photos, maps, and texts are linked together to illustrate or enhance a message.

Inherent in this approach is the role of the researcher/interviewer. This person creates the multiple recordings which are placed in a comparative framework. In the best cases the process begins before interviews are conducted. At this time, the researcher "plays with" possible screen configurations. This step is akin to determining a research design except that the idea is to arrive at themes which can be pursued to produce multiple perspectives on the people, places, and events of interest. The screens are really large categories which will guide future users to specific recordings. The categories get refined in the course of interviews and get finalized after the interview when the interview outlines are entered into the computer. In some cases, such as the North Slope Borough Project, the recordings were completed and the job was to look at the entire corpus of recordings, determine categories, and provide key word access. That project is very site and person centered so compiling accounts for each site provides very useful comparisons. In the NPS and NSB cases, we are continually reminded that we are preparing a collection of recordings for particular audiences and are forced to be very clear about the things we want to make available to them, and particular ways they might use the system (i.e. do they want picture identification, Native names and terms, or a portion of the screen devoted to topical searches).

Sometimes I think this new approach is akin to producing multi-media documentaries but, as a friend pointed out, "Jukebox" is not lineal; it encourages the patron/user to manipulate as they wish to pursue their own interests. Of course this means that the designer must try to anticipate user interests and build a system tailored to them. Never before has oral history been so focused on potential audiences/users, and never before has the interviewer's responsibilities been so inclusive.

Lest I leave you with a one-sided picture--too bright a picture--let me mention some of the unexpected challenges which we face:

- We still do not have a practical search/find play back feature. We are close but we are not there. Once we get that feature from Apple it will remain proprietary until we get special permission or it is released on the market.

- The original programming has taken far longer than expected and then was funded. The library has been very supportive as we struggle to complete projects. In part, the problem is that we keep seeing new potentials, and as we ask for new features, (bells and whistles) added time and money is needed to implement them. Hopefully we will be able to get to the point where we can simply copy programming from one project and apply it to the next. But, as noted, the variety of approaches are important because they permit us to tailor screen design for each project and their audiences.

- The directions we have taken are based on perceived needs and opportunities for grant support. As you all know, grant support rarely matches exactly your needs. There are many important things left undone or partly done as we try to build support for the new approach. It is a gamble that comes with an immediate cost in terms of administrative expenses, processing, and preservation.

Conclusion

I want to conclude by reiterating why the gamble is worth taking. I have argued that "Jukebox" will save us money in the future because it is a self contained automated work station. It will be able to search and find recordings, and after use, it will store them in a form where they can be easily retrieved. Digital preservation exceeds analog tape both in terms of shelf life and ease of copying. If we copy our digital tape on schedule we can be assured of producing loss-less copy, as opposed to copying analog tape which always involves some loss.

But of primary importance, I want to reiterate that this new technology revolutionizes the way we conduct interviews and the way we manage collections. Even if it is taking us longer than expected and the technology is expensive and hard for us to master, the overriding consideration is that we have found a better way to prepare for, conduct, and manage oral history, a way that makes better sense academically, and makes more sense in terms of preservation and access. As we implement "Jukebox", our tapes will become more useful and will be used more frequently.

- ABSTRACT -

FLORENCE NUPAAQ MALEWOTOK SKETCHES: A RARE ARCHIVAL RECORD FROM THE PEN OF A YUP'IK WOMAN

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Florence Nupaaq (Okinello) Malewotok (1905-1971), a siberian Yup'ik (Eskimo) from Gambell, St. Lawrence Island, Alaska, was a remarkable individual and an extremely productive artist. The distinctive style of her early drawings have led some to label her an "Eskimo Grandma Moses." Her restless talent found expression in numerous water colors and pen and ink drawings. She created detailed, true-to-life color depictions of every day activities and her peoples' clothing, tatoos and homes.

Over 100 of these drawings were collected by Otto Geist for the University of Alaska and have been housed in the Archives at the UAF Library for 65 years.

For those seeking more information about the collection, please contact the author.

Anthropological Resources of the Manuscript Collections, Rasmuson Library, University of Alaska Fairbanks

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Abstract

Anthropological resources of Rasmuson Library are briefly characterized and general overview of individual collections is provided. Most manuscript collections in the Archives contain some information about Alaska Natives and include letters, notes, diaries, drawings, photographs and oral tapes. Several collections are primarily about Alaska Natives, such as the records of anthropologists Froelich Rainey, Dorothea Leighton, Robert McKennan, Ivar Skarland, and Frederica De Laguna. Other collections with considerable information are the institutional records of the Alaska Diocese of the Episcopal Church, the Cooperative Park Studies Unit, and Alaska Native Corporations as well as certain individuals such as Otto Geist, founder of the University of Alaska Museum. Separate photograph collections and oral history tapes often augment these manuscript materials. Also available are film copies of many archival collections owned by other institutions. Among these are: the Oregon Province Jesuit Archives, Russian materials in the Shur collection, and Russian Orthodox church records as well as several smaller collections.

Introduction

For purposes of this paper, anthropology may be defined as that academic discipline which has as its focus the study of ethnic groups and associated cultures in pre-industrial societies, especially aboriginal residents and their descendants encountered during the expansion of Western civilization since the 15th century. Anthropology is broadly interpreted to be composed of the subdisciplines of linguistics, ethnology, archaeology and physical anthropology.

The term "Eskimo" will be used to describe selected Alaska Natives in this paper and some explanation for this usage is perhaps in order. We live in revisionist times, it seems, and regions of the former Soviet Union are not the only ones subject to changes of names for nations, geographic locales, and ethnic groups. While Canadians and Europeans tend to call these aboriginal peoples and their descendants Inuit, Alaskans have not yet found a satisfactory term which encompasses all these people in a way acceptable to the Inuit/Eskimo themselves. Alaska is home to two major Eskimo languages. While it is quite acceptable to identify Inupiaq speakers of northern Alaska as Inuit, the Yupik language speakers of Western Alaska, the largest Native linguistic group in the state, do not use this terminology to describe themselves. The use of Inuit to characterize all Eskimos in Alaska is similar to identifying Englishmen as Ukrainians. The languages may be related, but there are to say the least, considerable differences of culture and lifestyle. Thus Alaskans continue to use that outsider's unflattering appellation "Eskimo" for lack of a better term.

As an identifiable academic discipline, anthropology developed in the second half of the 19th century with particular expansion in the early 20th century. However, what would today be characterized as anthropological studies, began in Alaska well before this time. Ivan Veniaminov - Russian missionary to the Aleuts, later Bishop of Sitka and Metropolitan of Moscow, and recently Saint Innokentii in the Orthodox faith - began serious linguistic and ethnographic study of the Aleuts as early as 1824 and of the Tlingit in 1837. His notes on the Islands of the Unalashka District was published in Russian in 1840 and reprinted in Veniaminov's collected works, 1886-1888. Innokentii's work subsequently became the fundamental basis of all later ethnographic and linguistic studies of Aleut peoples. Thus it seems rather surprising that even though the U.S. has owned Alaska since 1868, it was not until 1984 that a full translation of the Notes appeared in English. There is still a considerable body of Veniaminov's notes, diaries, and letters which contain linguistic and ethnographic information which have not yet been translated into English.

Veniaminov was not the only precursor of anthropology in Alaska. William Healy Dall, a conchologist and natural scientist with the Smithsonian Institution, conducted the first serious archaeological excavation in Alaska in the years 1871-74 (Dall 1877). He trenched several shell middens in the Aleutian islands in which he noted stratigraphic levels and formulated a three period cultural chronology for the mounds. Dall also recognized the probable influence of the environment on cultural developments in the Aleutians. These activities were published in Volume 1 of John Wesley Powell's *Contributions to North American Ethnography* in 1877. Dall's formulations occurred decades before it became common practice in archaeological excavation to take note of stratigraphy and utilize it for cultural interpretation and time chronology (Willey 1974). Unfortunately, Dall's work seems to have had no impact on early archaeologists of the time and stratigraphic excavation in Alaska had to be reinvented in the 1930s by Frederica De Laguna, Henry Collins, Froelich Rainey, and others.

The University of Alaska Fairbanks was established in 1922 and remained a very small institution until about 1960; only some thirty-two years ago. At that time the entire library contained about 70,000 books and a Archives and Manuscripts Section did not exist. This department was established in 1965.

Within the Archives are many collections which are primarily of historical interest but which contain information about Alaska Natives as well. However, it is the intent of this presentation to provide a basic outline of only the major collections of anthropological interest. Some filmed collections from other institutions will also be described. The

Rasmuson Library Archives has more filmed collections than many archives because of its particular recent developmental history, the dispersed nature of primary collections among several states and nations, and the enormous distances researchers would have to travel to examine original source material. In this paper, archival collections are grouped into three categories: those from individuals, institutions, and miscellaneous collections.

Anthropologists' Collections

The Froelich Rainey collection (MS-262) contains business and personal correspondence for the years 1936-1946, diaries of field work at Point Hope, Alaska and on St. Lawrence Island during the years 1937-1940. There is a collection of Eskimo stories told Rainey by Point Hope residents, as well as hand-drawn maps of Point Hope and some miscellaneous papers. This collection is incomplete regarding Rainey's Alaska activities and additional material is at the New Bedford Whaling Museum in New England.

Robert McKennan's collection (MS-569) of 39 document boxes covers the years 1928-1980. McKennan was best known for his work among the Upper Tanana Athabaskan Indians and the Chandalar Kutchin. Records include research files, field notes, writing and publications, photographs, biographical materials, and some census records compiled by McKennan.

The Don Foote collection (MS-138) contains some 60 boxes covering the period 1850-1960. It includes correspondence, research notes, diaries, bibliographies, papers and articles related to Project Chariot, the proposed nuclear excavation at Cape Thompson near Point Hope, Alaska in the 1960s and important source information on Point Hope Eskimo history and whaling in the 1880s.

The Ivar Skarland collection (MS-292) spans the years 1933 to 1964, including many years as head of the University of Alaska Anthropology Department from 1946 to 1964. It contains correspondence, photographs, field books, lecture notes and miscellaneous materials relating to Skarland's anthropological expeditions and travels throughout Alaska. His work included archaeological, ethnological and museum activities. It should be noted that it is thought that this collection was purged of any material which might reflect negatively on Skarland prior to its deposit in the library and thus may not reflect accurately all aspects of his years in Alaska.

The Dorothea Leighton collection (MS-3-16) consists of materials on cross cultural psychiatry. There are interviews, stories, and life histories collected from Eskimos of Gambell, on St. Lawrence Island, Alaska in 1940, together with a series of photographs of life in Gambell at the time.

Margaret Lantis' papers (MS-156, MS3-015) consist of correspondence written by her during the years 1946-1963 and span her life from graduate school to a professional career in anthropology. These reflect her interest in ethnographic aspects of Eskimo life in Alaska, especially the Nunavak Island people.

Charles Lucier's collection (MS-206) spans the years 1936-1953. It contains an extensive group of Buckland River Eskimo myths, legends, and ceremonies. There is correspondence regarding teaching in Karluk, a Kodiak Island Native community, as well as school records, family histories, a 1938 census, and information on native arts, crafts, fishing and hunting. A large number of photo slides of his field work are included.

Institutional Collections

Perhaps the most important single source of information about Alaska Natives extending from the early Russian American period to the present are the Russian Orthodox Church records. These are comprised of several separate film collections (MS-281, MS-512) of originals in the Library of Congress and elsewhere. The church archives form a highly varied body of more than 87,000 items containing proclamations, clergy dossiers, translations, geographical files, vital statistics, photographs and other papers. They include priest's journals, journals of worship services, school journals, church registers, metrical records, confessional lists, marriage inquests and financial accounts. A related collection (MS-282) contains the Afognak parish registers for 1899-1967. A microfilm copy (MS-332) of Ivan Veniaminov's 511 page diary is part of this material.

Among the most extensive institutional collections (MS-111, MS-112, MS-542, MS-543, MS-545, MS-586) are those of the Episcopal Church. There are several separate groups of records which are related to each other. Among the earliest mission material in the collection (MS-405) is microfilm (MF98) of diaries of the Rev. Robert McDonald, Anglican Church missionary in the upper Yukon River region from 1861-1912. Important to Alaska are his years at Athabaskan village of Fort Yukon in central Alaska as well as travels to Rampart, Tanana and Nulato, Alaska. McDonald was one of the first translators of Northern Athabaskan languages and was, I believe, the first to attempt to translate and place Alaskan Athabaskan Kutchin and Han dialects into the Latin alphabet. Originals of his journals are in records of the Ecclesiastical Province of Rupert's Land in Canada.

The national Episcopal Church Archives collection (MS-545, MS-586) contains microfilm (MF142) of 89 boxes of original Alaska missionary records in the national Church Archives in Texas, together with Commissary Department Financial Papers and miscellaneous material, including photographs.

The Rasmuson Library Manuscripts section is the depository for the Episcopal Church diocese of Alaska (MS-112) and the collection currently contains about 50 document boxes of records from the 1880s to the present. It is especially rich in information about the church in Alaska in the mid 20th century but records are not equally representative of all Episcopal parishes in Alaska. The richest and most varied anthropological materials are from the Eskimo community of Point Hope. Processing of this collection has not kept pace with incoming materials and users should consult with the archivist when utilizing the collection.

Other Episcopal Church records include those of Archdeacon Hudson Stuck (MS-303, MF88) for the years 1902-1920, and some correspondence of Frederick Drane and P. T. Rowe, Bishop of Alaska (MS-658). Microfilm records (MF88, MF91) include parish registers for Ketchikan, Point Hope, Kobuk, Kivalina, Allakaket, Huslia, and Tanana. There are additional film records of selected parishes such as St. Peters at Sitka, and Fort Yukon.

Roman Catholic Church records are another source of information regarding Alaska natives. The Rasmuson Archives has no original records of the church but does have two much used film collections of Jesuit records, the Roman Catholic religious order most active in Alaska. These films are the Jesuit Mission records of Alaska Native Languages (MF175) covering the late 1800s to the 1950s. Content includes central Yupik and Inupiaq Eskimo languages together with the Ingalik and Koyukon dialects of Athabaskan from western and central Alaska. Documents include dictionaries, grammars, and texts.

The second collection (MF35) consists of microfilm of mission records, ledgers, and diaries from Native villages at Holy Cross, St. Mary's, St. Michael, Nulato, and Tanana; as well as Valdez, Cordova, Eagle, Fairbanks, Ketchikan, Nome, Douglas Island near Juneau, and other locations where Jesuits were active between 1871 and 1950.

A characteristic feature of Alaska has been domination of economic life by single corporations for much of its history in both the Russian and American periods. The commercial records of these firms are important sources of information regarding cultural change among native peoples. These records are: Russian American Company materials for the period 1802-1867 and its successor in the American period, the Alaskan Commercial Company.

The Russian American Company was chartered by the Russian Czar in 1799 with a monopoly over Alaska's resources and commercial activity. The collection (MF7) consists of 77 reels of microfilm of original records housed in the Library of Congress. They include communications from the Boards of Directors in Russia to the Governor General in America, outgoing correspondence of the Governor General, logs kept on company ships, journals of expeditions by Arkhimandritov on Kodiak Island, in Norton Sound, and the Pribilof Islands and Lieutenant Zagoskin's travels in the lower Yukon basin in 1842-44.

The Alaska Commercial Company collection comprises 156 document boxes for the period 1868-1922. Records are selective in that there are records from the Kodiak and Unalaska districts of the company, but the records from the St. Michael and Pribilof Islands are missing. Documents include account books, contracts, inventories, letters received and sent, requisition books, vessel accounts and manifests as well as administrative records of the home office in San Francisco and records of other companies with which the Alaska Commercial Company had contractual agreements. Minutes of meetings of the Board of Directors are available on microfilm (MF13) from originals in the library of the California Historical Society. This company was usually the only commercial enterprise in many Native

Alaskan villages and provide an alternative to missionary and governmental records of the late 19th and early 20th century.

Miscellaneous Collections

Another major source of anthropological information from the Russian period is the Leonid Shur collection (MS-599). This collection is a varied body of filmed records (MF194) from Russian archives concerning political, economic, and cultural relations in the 18th and 19th centuries and the history of Russian exploratory expeditions in America. These films include writings of Khleonikov, Veselago, Vasil'ev, Krusenstern, Wrangel, Kuskov, Voznesenskii, and Matiushkin and in most cases constitute the only copy of the original manuscript source material outside of Russia. Also present are reproductions of drawings and water-colors made by artists Tikhanov and Mikhailov during exploratory voyages. Anthropological material is often secondary to historical and political considerations in the Shur collection but these materials contain some of the earliest contact descriptions of coastal Alaskan Natives by educated explorers, military and political leaders of the time.

Three collections provide anthropological data on recent status and activity of Alaskan Natives. The Cooperative Park Studies Unit collection (MS-537) contains 54 boxes of material. This Unit was a branch of the National Park Service which documented historic site claims of Alaska Natives under the Alaska Native Claims Settlement Act in the 1970's. Material includes audio tapes with Native elders about historic sites, maps, photographs, original manuscripts produced for publication, historical overview and supporting documentation for lands clams. It is arranged by the 12 Native Regional Corporations established by the Act and historic site within a Corporation Region.

The Alaska Native Review Commission collection (MS-508) contains the results of a review of Alaska Native status as a result of the Alaska Native Claims Settlement Act by Thomas R. Berger, Canadian Barrister. The Commission examined socioeconomic status, history, and intent of the Claims Act of 1971, historic policies and practices of the United States in settling land claims by Native Americans and the role of Native Corporations in fulfilling the "spirit" of the Claims Act. This collection contains records of public hearings, transcripts of all hearings, a subject index to the hearings and recording logs and is an invaluable record of Native Alaskan attitudes and aspirations in 1983. The collection also includes correspondence of the Commission, press and media materials and published and unpublished reports and papers gathered by the Commission's staff.

The Curry-Weissbrodt papers (MS-539) are records of the Tlingit and Haida Indian tribes of Alaska saved by attorneys Curry and Weissbrodt who worked on land and cultural claims of the tribes from the 1940s to 1970s. Microfilm (MF123) of these records of the Sealaska Heritage Foundation of Juneau, Alaska include materials on tribal administration, lawsuit records, lobbying efforts and reference books, newspaper, and magazine clippings and government reports about Alaska Natives.

The Otto Geist collection (MS-146) is one of the largest individual archival collections with 125 boxes of material covering the years 1927-1963. Geist was a self-taught collector of paleontological and archaeological material. His work produced one of the largest Eskimo archaeological collections in the world and formed the basis for the University of Alaska Museum. The archive collection contains correspondence, reports, notes, specimen catalogs, maps, photographs of specimens, sites, and Alaska Natives. Much of the material relates to his expeditions to St. Lawrence Island and excavations of the village of Kukulik in 1926-29.

For information from a native perspective there are several small collections in the Archives which contain the records of individual Athabaskans and Eskimos. Emily Ivanoff Brown (MS-64) was an Eskimo teacher, student and author whose collection focuses on her efforts to record and preserve the literature, songs, and customs of the Eskimo. The Ethel Oliver collection (MS-581) preserves notebook, journals, papers and photographs of herself and her Aleut author husband, Simeon Oliver. Records of Simeon Paneak, Headman of the Anaktuvuk Pass Eskimos are present as well. The Minto, Alaska Village Council records (MS-393) provide a perspective on the period 1939-1948 of that Athabaskan community. Mary TallMountain collection focuses on the activities and poetical writings of this Athabaskan woman from Nulato, Alaska. The Alfred Kitzler collection (MS3-41) focuses on his work for Native rights and land claims in Nenana, Alaska and Athabaskan in particular. There are other small collections which can provide anthropologists with limited information that are not included above.

The above review has briefly outlined the major anthropological resources of the Archives section of the Rasmuson Library at the University of Alaska Fairbanks. This information should provide the interested researcher with a basic introduction which will inform and serve as a basis for judgement as to the desirability of further examination of these anthropological resources.

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REDISCOVERING RUSSIAN AMERICA: ARCHIVAL SOURCES OF THE RASMUSON LIBRARY, UNIVERSITY OF ALASKA FAIRBANKS

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Abstract

Russian America represents a very significant and vibrant portion of Alaska's and Russia's history. The period has generated a significant body of documentary literature, as well as irreplaceable collections of primary sources that help to illuminate that passage of history. This presentation will examine some of the major archival sources relating to Russian America, found in the Rasmuson Library. The primary collections considered are: *The Records of the Russian-American Company*, the *Leonid Shur Collection*, and the *Alaskan Russian Church Archives.*

Introduction

One of the purposes of the Elmer E. Rasmuson Library Archives is to collect, preserve and make accessible records on the history of Alaska. The department seeks to acquire primary sources, records and papers that help to document the rich fabric of Alaska's history. Thus, the library can offer a broad spectrum of resources for the researcher. Together, the Archives, the Rare Book Collection and the Alaska Polar Regions Collection represent an excellent assemblage of Alaska related materials. Within these collections, the primary sources relating to the Russian American era play a very important role.

The period of Russian settlement in Alaska, as well as, American Northwest has generated a remarkable body of scholarly documentary, as well as, fictional literature. Yet, often research on Russian America is complicated by the rarity of records, many of which were destroyed, lost or perished. In 1927, the Archpriest Turkevich stated in the *American Orthodox Messenger* (1927, no.2) that "it is extremely difficult to give an exhaustive picture of the past 125 years of the life of the Russian Orthodox Church in America. . . A great deal has not been recorded, a great deal has been lost, and another part has been composed with so much legendary element. . . that it is often difficult to recognize the truth." This quote could well be applied to several sources dealing with the Russian-American period. The purpose of this essay is to provide a brief introduction to some of the major archival resources found in the Rasmuson Library relating to Russian America.

What is Russian America?

The Russian Era in Alaska is generally defined as the period of Russian settlement in Alaska and the American Northwest. It is often viewed in three segments. The first period (1775-1785) represents the initial interaction of the Russians with the Aleuts and their conquest; the second period (1786-1824) witnesses the establishment of the Russian American Company under Shelikov at Kodiak - and the American Period extended from 1867 to present. In retrospect, the exploration and history of Russian America was very colorful, creating a multi-national and multi-cultural mosaic of discoveries and betrayals. The Russian period was lengthy, and in those 120 years left a permanent imprint on the land and its people. Its full legacy is recognized and it has generated much scholarly interest in the United States, Canada and Russia. In Russia, the interest escalated after the Second World War, and is continuing to escalate. International cooperation is very evident in the field, as exemplified by the works of Drs. Lydia Black, Svetlana Fedorovna, Rosa G. Liapunova, Richard Pierce, James Van Stone, N.N. Bolkhovitnikov, and many others. There have also been international conferences held on Russian America: in Sitka, in 1979 and 1987; as well as the very significant "Crossroads of the Continents" exhibition, sponsored by the Smithsonian Institution's Museum of Natural History and the Academy of Sciences in Washington D.C. in 1988; and lastly, the exhibition: "Russian America, the Forgotten Frontier" held in Anchorage in 1991.

The research interests of the scholars working in the field covers an extensive range: economics, cartography, archaeology, linguistics, anthropology, history, bibliography, art and literature, Regardless of the areas explored, the access and availability of primary sources is critical to the mission.

The Records of the Russian-American Company 1802, 1817-1867

The story of the Russian American Company constitutes one of the most remarkable passages in the process of Russia's penetration to the Pacific shores. It is a heroic epic of great discoveries and multiple betrayals. The Company's records depict an administrative saga of colonization, recorded by many hands, reflecting multiple philosophies and ultimately embracing a vibrant panorama of human lives.

The records of the Russian-America Company, 1802-1867, particularly the correspondence of the Governor's General, are an irreplaceable source of primary information on the Russian administration of the Alaskan peoples as well as the Company itself. The original orthography has been preserved in all the letters and documents. These records were transferred to the United States Government, in accordance with the treaty of cession signed March 30, 1867. In accordance with this provision, the 92 volumes of the Records of the Russian-American Company were to be turned over to the State Department.

The collection is overwhelming - consisting of nearly 33,000 folios, 6,600 pages. Fortunately copies are available now on 77 reels of microfilm, the contents of which are divided into four parts: reels 1-25, letters received by the Governor's General, 1802-1866; reels 26-65, letters sent by the Governor's General, 1802-1867; reels 66-76, *Logs of Company Ships*, 1850-1867; reel 77, *Journals of Exploring Expeditions*, 1842-1864. An understanding of Russian paleography is helpful in deciphering them, and there are handwritings indeed, that are almost impossible to comprehend, especially if ink blotches interfere. Unfortunately, a total translation of these records does not exist yet. The work done by Dr. Raymond Fischer in 1971, covering volumes 1-6 of *The Correspondence of Governor's General, Communications Received* and the calendar of those documents is, of course, very useful. This shortcoming is currently being addressed by Ms. Katherine L. Arndt and Dr. Richard Pierce of Limestone Press.

In analyzing the documents one is impressed by the wide spectrum of subjects covered in the correspondence. Examining several of these records of the Russian American Company, especially the correspondence of the Governor's General, provide us with valuable insight not only into the administrative practices and problems, but above all they provide a vast amount of information about the people associated with it. Subjects include, but are not limited to: disputes about boundaries, administrative issues, personnel matters, serious concern about medical and health issues; ethnic relations; encouragement and support for the education of the native people; concern over retirement of company's employees; intermarriage; church administration and its relationship to the Company; concern over alcoholism; physical abuse and cruelty; economics; legal affairs, etc. Thus, these records help to humanize a very important and colorful passage in Russia's and Alaska's history. So many of the concerns relate to issues our society is still deeply struggling with. Glancing through the images of often tattered pages we find, for example: (In folio 55-53; no. 188) a poignant letter sent to Baranov on March 22, 1817, urging further education for the Creoles. Encouragement is given to send more Creoles to Russia to pursue studies of pharmacy, medicine, bookkeeping, and other useful occupations and crafts such as shipbuilding. A contemporary note is heard in a letter of November 1916 (Folio 65; no. 195) that an unfortunate fellow Svinin owes considerable money to a petty burgher (meschianin) Startsov. Svinin is threatened with garnishing of wages until the debt is paid! Several letters address the theme of drunkenness and physical abuse of men as well as women; physical cruelty to employees is freely talked of. There are several interesting letters of 1802, in which secret instructions were sent from St. Petersburg, regarding the supervision of foreigners in the Company's employment.

Regardless of the order, not all the Company's records were transferred to the United States. There are periods for which records are missing. The Russian American Company's activity in Russia and Siberia are not represented in the records, but as Fischer states, they are also not available in Russia. There is also a serious unexplainable lack of correspondence between 1799 - the year of the founding of the Company and the year 1817 (Fischer, 1971). Given the communication difficulties between St. Petersburg and Novo-Arkhangelsk, it is indeed, quite amazing that this number of letters does exist. Very often, important letters were sent in duplicates by two routes: the 'round the world route from St. Petersburg or Kronstadt around Cape Horn of Cape of Good Hope to Novo-Arkhangelsk, (18,000 statute miles!) or by the second route going overland across Russia and Siberia to Okhotsk and from there, across the North Pacific to Novo-Arkhangelsk (10,000 or so statute miles).

From an ethno-cultural perspective, these *Records of the Russian-American Company* provide extensive information about the processes of assimilation and culture change in Aleut, Eskimo and Indian communities, particularly of the Nushagak River Region (Winston L. Sarafian and James W. VanStone, 1989).

Much useful information can also be found regarding the problems of fur trade and the internal organization of these trading posts: how were administrative decisions made, when and how were activities expanded and what were the relationships between the general managers at distant outposts - such as the Aleksandrovskii Redoubt. The documents also are extremely informative about ethnic interrelationships between the two Eskimo groups: Kiatagumit and the Aglemiut. The records indicate numerous instances of hostilities between these groups. Thus, for example, in Vol. 4, no. 164, folios 52-53, March 5, 1824 - the communication between the St. Petersburg's Office and General Manager Muraviev indicates how to deal with hostilities that have broken out between the Aglemiut, Kiatagumit and the Kuskowagmiut living in the area of Aleksandrovskii Redoubt (Ibid.)

The Company's records also provide definitive information on company's treatment of Creoles, an issue well addressed in Microfilm No. 11 of the Correspondence of Governor's General of Russian-American Company. Thus, these records form the very cornerstone for our understanding of Russian America.

The Leonid Avel'evich Shur Collection: Parts I, II

Some of the most significant, unique resources for the study of Russian America are the microfilmed materials assembled by the ethno-historian, Dr. Leonid A. Shur, who was formerly with the Academy of Sciences Institute of Ethnography in Moscow. The collection includes material from eighteen Russian and Estonian archives, libraries and museums in Moscow, St. Petersburg, Perm, Kungur, Tallinn, Tartu, and others. The main archives utilized are: The Archive of the Geographical Society - Russian Academy of Sciences in St. Petersburg, Perm District Archive; The Central State Historical archive in St. Petersburg, Central State Historical Archive of Estonia in Tartu; The Lenin Library Manuscript Division of Moscow; the Archives of the Pushkinskii Dom, St. Petersburg; the Vologda District State Archive; the Saltykov Shchedrin State Public Library; Totma Regional Museum; State Russian Museum (St. Petersburg). The Rasmuson Library purchased the collection in two parts after long negotiations in Paris in 1982 and 1991.

Dr. Shur's discriminating eye and broad scholarly knowledge of Russian America has created an extensive research collection useful for anthropologists, historians, ethnographers, geographers and others interested in exploring the subject. These materials are particularly important because many were derived from archives, several of which have been previously off-limits to Western scholars.

The Shur Collection is extremely multifaceted: its copious documents (over 300 files) draw much of their content from correspondence, travel journals, legal testimonies, autobiographical and biographical materials, diaries as well as manuscript journals kept on Russian circumnavigations coming to Alaska. Thirty five of these voyages, including expeditions to Russian America occurred between 1803 and 1849. On all these, naval officers kept records, journals and diaries. The descriptions of these voyages give the reader personal impressions and multiple perspectives of the same event. For examples there are the notes and journals of I.A. Hagemeister on the "Suvarov" and "Kutuzov" voyages; Khlebnikov's observations on the "Riukik"; F.F. Matiushkin's and F.P Litke's remarks of the "Kamchatka" voyage, as well as others.

One of the most voluminous and significant portions of the *Shur Collection* relates to Kirill Timofeevich Khlebnikov (1785-1838), customarily referred to as "the patriarch and chronicler of the Russian American Company" (Shur, 1990). His records are especially valuable because he spent an extensive period in Alaska, becoming the General Manager of the Russian American Company in 1818 (R. Pierce, 1990). During all of his travels and tenure with the company, he kept encyclopedic observations in his "Zapiski Ameriki", (Notes on America), thus his observations give us one of the most detailed accounts of the period. The records offer the reader a personal glimpse into the lives of well known figures such as: Wrangel, Baranov, Hagemeister, Rezanov and others.

Ferdinand Wrangel (1796-1870), a well known geographer and voyager and the Chief Manager of the Russian American Company (1830-1835) is also well represented in the *Shur Collection*. Much of the Wrangel related material was acquired from the *Wrangel Archives* in Tartu. Equally useful are the collections of documents and notes gathered by F. Veselago (1817-1895), an historian for the Imperial Navy. The *Shur Collection* even contains a biography of Kuskov, who was the founder of Fort Ross. There are many who contributed to this historical mosaic. All of these journals, notes, and correspondence found within the images of often worn, ink-blotted pages illuminate many of the lesser known issues and concerns regarding Russian America. The personal glimpses into the private journals and other writing help to bring the epoch to life.

Perhaps one of the most enriching additions that appear in the collection is made by the artists that accompanied the voyages. The paintings and drawings made during these voyages enable us to participate visually in the discoveries. The remarkable works of P.N. Mikhailov, L. Khoris, M. Tikhanov are not only beautiful as they pulsate with vibrancy of designs, they are also remarkable for their richness, accuracy and detail. The aesthetic element permeates these distant images, as they draw us closer to the past - Tikhanov's "A woman from Kad'iak named Tamaima" evokes the image of an icon of a distant realm.

The second part of the *Shur Collection* is particularly rich in illustrations and portraiture; P. Mikhailov's and Tikhonov's works once again give us glimpses of lands seen, as well as, excellent portraiture of individual subjects: Baranov's portrait (Tikhanov); portrait of F. Litke, done by an unknown artist and by Giraud; F. Wrangel's portrait by Giraud; portrait of Matiushkin by Chirikov, etc.

The second part of the *Shur Collection* supplements the first part very well. Of exceptional importance here is the second part of the "Khlebnikov Archive", Khlebnikov's manuscripts relating to Russian America (Folio 445). There is more correspondence with significant figures such as: M. Murav'ev, L. Hagemeister, S. Janovskii, P. Chistiakov, and letters of the managers of the Russian American Company. Thus, taken together, the *Shur Collection* enhances the research panorama on Russian America very broadly.

Alaskan Russian Church Archives

History, spirituality, myth and legend are tightly interwoven into the concept of Russian America. The Russian Period set deep roots into the soil and native culture of Alaska. For it, the Russian Orthodox Church and the Russian American Company were the cornerstones upon which the Russian Imperial Government fashioned their colonial extensions. One of the most delightful reminders of Russian America one encounters so often while traveling in Alaska are the simple white churches crowned by onion-domes and the Orthodox three-barred crosses. More than sixty of these chapels and churches are found in Alaska. Thus, these visual reminders are indicators of the lasting influence of Russian Orthodoxy in Alaska. It is evident that the records of the Russian Orthodox church are an irreplaceable resource for the understanding of Alaskan history, particularly as the shadow of Russian orthodoxy extends over Alaska to the present day.

The majority of these Alaskan and Siberian records are housed in the Manuscript Division of the Library of Congress, Washington, D.C. The Library of Congress received these records initially in 1927 as a gift from most Reverend John S. Kedrovsky, Metropolitan of the Russian Orthodox Church of America and Canada (Smith, 1980).

A portion of these records were described in 1936-1938, in: *Documents Relative to the History of Alaska* by the University of Alaska, now available in the Library of Congress Manuscript Division and also on microfilm. In 1979 the State of Alaska joined with the Library of Congress in a project to organize and describe all the records in the collections of the Alaskan Church Archives and to produce a microfilm edition. The inventory for this monumental project was conducted by Ms. Antoinette Shalkop and as a result, the microfilm edition is available on 401 reels of microfilm. Linear feet of shelf space occupied: 326, approximate number of items included is 87,000. This represents a very broad collection, encompassing 200 years, from 1730's to 1930's, covering immense geographical areas, as these records trace the activities of the Church in Siberia and throughout the colonial settlements in Alaska. The geographical areas covered in Alaska are: Sitka, the Aleutian Islands, Atka Island, Unalaska Island, Pribilof Islands. Nushagak, Belkovski, St. Michael Ikogmiut - Kolmakov, Yukon-Kushokwim, Kodiak Island, Kenai Peninsula, Chugach and Southeast Alaska. Generally speaking, the files contain Geographical Files: 1733-1938 and Dossiers of the clergy: 1762-1929. The contents of the records vary greatly in quality, and there is no consistency of archival pattern, although periodically, record maintenance seems to follow a more consistent pattern. Not all areas in Alaska are copiously represented, many records are missing. This is partially due to the fact that the education level and the dedication level of record keepers varied greatly, and the administrative formats kept changing affecting the life of parishes. All dates recorded are based on the Julian calendar.

Arrangement of the Collection

The archival records indicate eight basic categories: (12 containers) *The Ukaz File*: Contains Proclamations, or Orders or, Imperial Edicts. The file also contains ecclesiastical decrees, orders and administrative rules. *Clergy Dossiers, 1762-1929*: (41 containers) addresses personal concerns of about 400 clergymen of varied ranks and geographical locations in Alaska and Siberia. *Translations, 1835-1911*: (3 containers) contains religious writings, primers, dictionaries of native languages, notes and varied linguistic materials. *Geographical Files, 1733-1938*: This represents the major corpus of church records, which includes two-thirds of the whole collection. It is a highly diversified, useful collection, because it reflects multiple activities of the parishes located in the twenty geographic area represented. The geographic inclusion moves from west to east, following the pattern of the expansion of orthodoxy in Alaska. We move from Siberia to Kurile Islands, Bering Island. . . Aleutian Islands. . . Atka Islands, Unalaska, etc. Within these areas each geographical file within the regions is divided into parishes, which are defined in terms of operations, services and functions: Baptism: certification and regulation, birth certification, documents pertaining to the confirmation of marriages are often included. The records also contain priests journals, Church registers, confessional lists, metrical lists and records. *The Church Register*: provided descriptions of the parish as well as the ethnic and social composition of the parish; sometimes it contained geographical information as well. *The Metrical Records and Confessional Lists*: These represent an immensely valuable genealogical research tool, as they describe the family relationships of the bride and groom, and their godparents; it also clarifies patterns of intermarriage between the Russians and the native people, and other nationalities. *The Financial Records*: Arranged under subheadings: collections, contributions, financial regulations, etc. These documents, often kept in meticulous detail, give us an excellent understanding of the harsh economic realities facing the Alaskan parishes.

Thus, the massive corpus of the Archives of the Russian Orthodox Church in Alaska provide us with an irreplaceable wealth of information concerning every aspect of life affecting existence in Russian America. It is an official reflector, a record of a spiritual odyssey, a living document of all those who enriched Alaska's history.

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THE NATIONAL DATABASE OF ARCHIVES INFORMATION IN SWEDEN

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Introduction

At the end of the nineteen eighties we had an extensive investigation of archives and records management in Sweden. The investigation was performed by "arkivutredningen", the committee on archives and records, which in the report "Öppenhet och minne", memory and recollection, among other things proposed that a database of archive information would be established. The parliament and government later decided to establish such a database.

The project, named the national database of archives, started in 1990 and is at present in a period of construction.

The project team consists of three persons chosen from the archive authority. As a consultative group they consult an alliance group with members from the archives, libraries and museums.

The parts that share an interest in realizing this project are the archive authority, other archive institutions and the university of Linköping in Sweden.

The project will end in 1993, and the work that remains will be handed over to the archive authority, which will continue the task.

Purpose, Goal

The main purpose with this project is to develop an ADP-based search system concerning archive information in Sweden.

The database system has some primary functions. It is intended to give information about all archives and records in Sweden, primarily those from the public archives, but also information concerning the approximately 120,000 private archives and records that now are registered in manual registers, kept in the National Archives. In the database you will find information about where the archives and records are kept, in what extent they are available for researchers and a survey of the principal contents. It will also tell you if the information is stored on other media, for example microfilm or microfiche.

The database will also give you information on how to use the archives and the principal subjects of the archives. It will also give you the opportunity to search in associated ADP-based help-registers, such as personal registers connected to a specific archive and letter-writing registers just to name a couple of them.

The intention is that the system should easily be available to record researchers and ordinary people.

The System Construction

The national database of archives will, contrary to it's name, contain several different databases. To connect all information from the different databases and help the researchers in a satisfactory way, a system of knowledge will be developed. Graphically, the system can be presented as Figure 1 shows.

The national database will consist of three main databases and several help-registers. The record list database is one of the main databases. It contains not only information about all public and private archives, but also all of their archive records lists.

The other main database is the archive register. The main purpose for the archive register is to provide the record researchers with different ways to find answers to their questions. This register will contain additional information concerning the different archive makers stored in the record list database. Examples of such information is archive classing into predefined groups: the archive's main subject, topographical and geographical information, specific names of persons, availability for researchers and where the records are kept, to name a few. Information of that kind will reveal itself to the archivist during the process of making an archive records list.

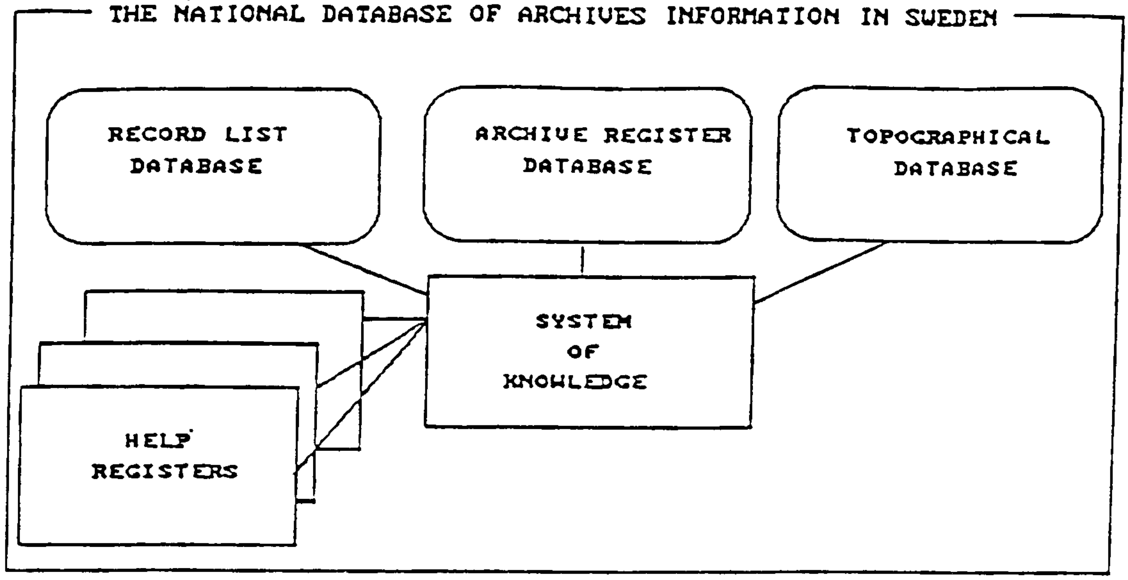
The third main database is the topographical database. The purpose of this database is primarily to find out the right class of an authority among a group of authorities at a specific age. The starting point for the search is the topographical or geographical information you provide the system.

The help-registers, will be different files, mostly personal registers associated to a specific series of books, but will include letter-writing registers, subject-oriented registers and so on. The quantity of this kind of help-registers, will naturally increase over time.

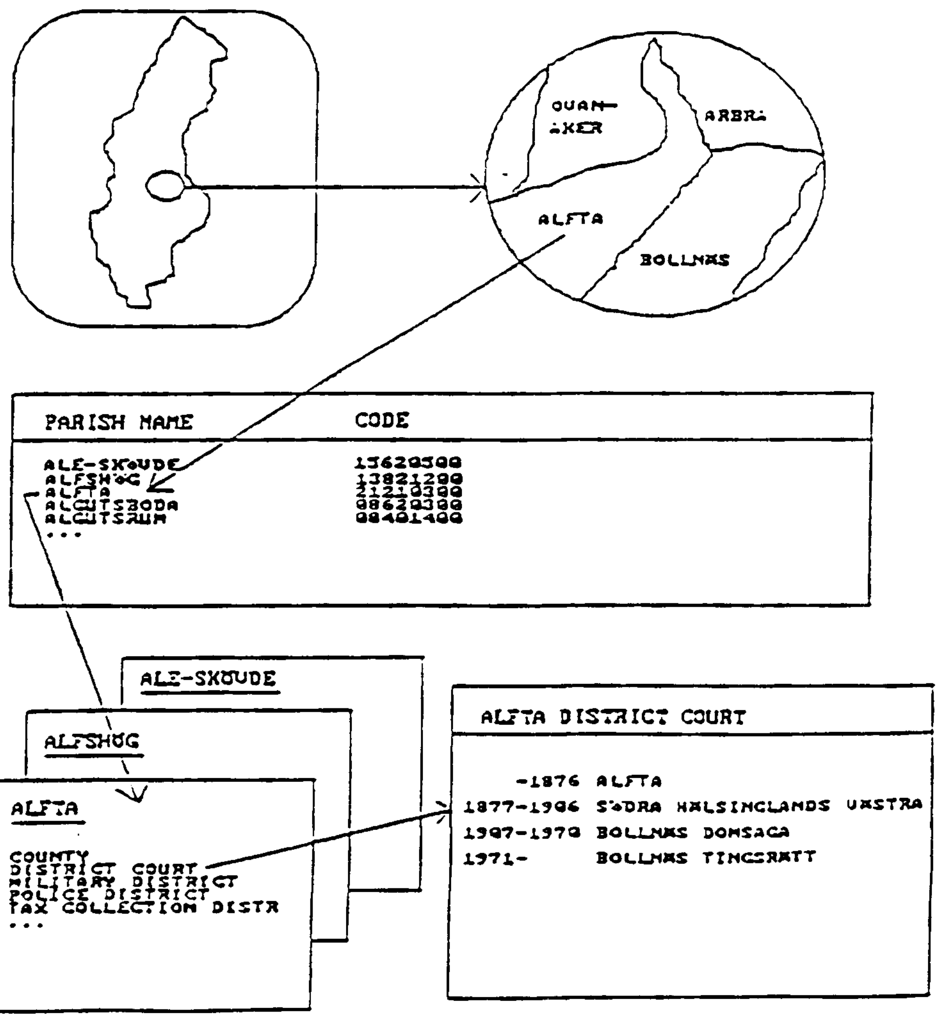
The Topographical Register

Figure 2 shows the topographical register. This register contains two connected parts, on one hand the topographical information, and on the other, information concerning the grouping (classing) of the authorities.

(picture 1)



(picture 2)



The church-parishes are the administrative area which has been most stable during the centuries. For that reason it is selected to be the backbone of the topographical register. Each church-parish is codified in a Swedish standard code. The parishes that no longer exist or have changed their reception area are also coded.

With the choice of the church-parish as a lowest common denominator, you also get the possibility to connect to other disciplines such as the libraries and the museums. Through the parish-code it is possible to connect to the coordinates of the Swedish map. As a result of this connection one can "point" at an area on a digitalized map and receive the correct parish-code for that area.

The church-parishes will then form the foundation for other administrative, judicial, ecclesiastical and even military area classings. There is also information concerning the period of validity for each area classification.

The System of Knowledge

The system of knowledge, Kunskapssystem i arkivmiljö (KAM), is a part of the project. The development of this system will be in co-operation with the University of Linköping in Sweden. The purpose with this system of knowledge is to tie the different databases together and act like an "electronic archivist" supplying the researcher with Swedish administrative history. The goal of the system is also to give the researcher a suggestion of using the right archives and records. Since the system of knowledge is tied to all databases and help-registers, it would be able to sort out all information concerning a specific question.

National Archive Database Function

The complete function for the national database of archive information can be described as Figure 1 shows. First you must have a question that needs to be answered. In this example, a common question for a genealogical researcher might be as follows: Is there an estate inventory concerning the farmer Pehr Andersson who died about 1890? You also know that he probably was residing in the parish of Alfta.

To start with, you tell the system what kind of subject you are looking for, in this case it is estate inventories. The function in the system of knowledge which serves the Swedish administrative history, will easily find out that state inventories could be found among the district court archives.

Now the system will use the topographical register (Fig. 2). The system will show you a map covering Sweden. You could "point" to a particular place on the map or more directly write down the parish name. The system continues with a question concerning which time period you are interested in; in this case, you would write 1890. The topographical register will search through its information and find out that the district court archive for the parish of Alfta in the given year 1890 is Södra Hälsinglands västra tingslag.

The system continues using the record list database (Fig. 3). It will easily find the record lists concerning Södra Hälsinglands västra tingslag. With a little help from the electronic archivist in the knowledge system, it will tell you that inventory lists can be found in the archive series FII-ESTATE INVENTORY LISTS. It will ultimately put you in the position of the right series at the right volume for the given year 1890.

At this point (Fig. 4) the archive register is able to give you additional information concerning this specific archive: such as where the archive registers are kept, availability for researchers, guide to use this specific material, etc.

Now the system checks with the help-registers. If there are any, it will be possible to search through them. In this case, there is a personal index concerning the estate inventory lists (Fig. 5) and we will enter the name Pehr Andersson and his place of resident, Alfta. The search through this help-register tells us that there is a Pehr Andersson in Alfta and you can find him in volume FII:9 on page 128.

This, of course, is a textbook example of the possibilities of the system. The purpose of the system is to be able to guide the researcher in simple, as well as, in more complex situations.

The Using of Standards

In order to make the systems different parts co-operate, we have entirely used the code-system made by the Statistics Sweden (SCB).

Within the project, we have also realized the necessity to create a data-element catalogue. The reason for and the purpose with this catalogue, is to make it possible to connect data files made in different technical environments.

Some standard software has been developed to suit the national database system. The reason for this is to make it possible to start up an extensive input process quickly.

User Interface

The database will be available for all who have access to a personal computer and a modem. The database will also be published on optical CD-ROM discs. The disc will be updated every year.

(picture 3)

```
RECORD LIST  Södra Hälsinglands Västra

SUMMARY:

A:I    JUDGEMENT BOOKS
C:I    INDEXES AND LEDGERS
F:II   ESTATE INVENTORIES
...
```

```
Södra Hälsinglands Västra

ESTATE INVENTORIES                          F:II

volume nr     time                notes
...
6             1887-
7             1888-
8             1889-
9             1890-1892
10            1893-
11            1894-
...
```

(picture 4)

```
ARCHIVE REGISTER DATABASE

SÖDRA HÄLSINGLANDS VÄSTRA

KEPT:      Landsarkivet in Härnösand
           Address: Box 161, 871 24 HÄRNÖSAND
           Open: 8.30 Am - 4.30 Pm
SECRECY:   No
MEDIA:     Original books, microfiche
           Fichenr : S82312 - S82324
INDEXES:   Yes, personal register—Estate inventories
...
```

(picture 5)

USER INPUT:

PEHR ANDERSSON
ALFTA

PERSONAL INDEX

Andersson, Anders	ALFTA	1877	FII:1, 14
Andersson, Johan	OVAN-ÅKER	1894	FII:11, 256
Andersson, Karl	ARBRÅ	1889	FII:8, 658
Andersson, Karl	ALFTA	1892	FII:9, 725
Andersson, Pehr	ALFTA	1890	FII:9, 128
Andersson, Zachris	OVAN-ÅKER	1877	FII:1, 99

...

The Swedish public libraries are in the process of replacing their micro-fiche readers with personal computers with connected CD-ROM readers. This will give us the opportunity to distribute the national archive database on CD-discs to the general public via the public libraries.

The computer user interface will be as user-friendly as possible, probably in the same style as Microsoft Windows.

The Present Situation

An extensive input process is in progress and has been for several years.

The archive list database concerning all public, as well as, private archives and records are rapidly growing, although it will take some time before all records are stored in the database. The information in the archive register database are connected to each archive in the archive list database, so it will grow parallel with the archive list database.

The work with the topographical database is running smoothly, and it is expected to be finished in 1993.

A prototype of the system of knowledge has been developed and tested. The purpose of the prototype was to give answers to some of the questions which will arise in using systems of this kind. Among the answers, the most important was the delimiting of the system and the need of a data-element catalogue.

The final system of knowledge will not be developed until after the project ends. The main reasons for this are that we most likely have not found all the problems yet and that new and better versions of the knowledge software are continuously being developed by the software companies.

A large amount of the help-registers are complete and new ones are continuously being added.

As a pre-test of the final archive database system, all system components, except the system of knowledge, and all the public archive information will be connected into a test system. The system of knowledge will be replaced by a more conventional search system. This limited version of the national archive database will be evaluated and adjusted, and finally published on a CD-ROM disc. This disc will be distributed in a limited edition to the public archives. This will happen during 1993.

Problems

During the project's time, new problems and questions will arise. The technical problems have, however, been solved up to now. With today's hardware and software development, it looks like it will be more and more easy to realize goals.

To date the biggest problem has been to create personal and economic resources to the extensive input process in building the information databases. Another important question or problem, is the quality of data. What level of quality do you have to reach to feel reliability in the system?

The Future

This project will end in 1993. The limited database system will hopefully work as it was meant to do. The evaluation of the limited system will be the starting point for the final archive database with the knowledge system included. The continuous work will be handed over to the archive line organization.

One of the future plans is to get direct access to information which has been scanned and stored in the database. This information may consist of very frequent archival series. Tests with scanning and even Optical Character Reading (OCR) have been done. The result was satisfactory and promising, but will require faster and better computers and software to make it work smoothly.

ARCHIVAL AND OTHER DATA FOR AN ANTARCTIC CHRONOLOGY

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Abstract

The many sources of data used in compiling a chronology of Antarctic exploration and in maintaining the computer records are discussed and selected examples given. These sources are exceedingly diverse: artifacts (inscriptions on remote islands e.g. sealers' graves), archival sources (manuscript journals and the latest exchanges of information under the Antarctic Treaty), and various published items. Ancient and modern archival materials from the Scott Polar Research Institute's sources were essential for the work. The use of the early records in modern research and some of the principles adopted to define the regions involved are also described.

Introduction

Ladies and Gentlemen: at the Scott Polar Research Institute, during a period of years, I have organized concise records of the chronology of Antarctic exploration. This principally involves the various specializations of history and of geography of the regions. These data compiled to 1988 were published in 1989 (Headland) and it is intended to print a supplement several years hence. The present electronic record extends over 3 Mega-byte of data. The information used in the work covers a period of 2700 years and is in 19 languages, which, not unexpectedly, show a much greater than usual variability among the sources. I propose to describe the work, and mention some specific problems and solutions with the data through the different periods of Antarctic history.

There have been several other compilations of the history of Antarctic exploration: the one I developed evolved from that which Dr. B.B. Roberts compiled in 1945 and published, with additions, in the journal *Polar Record* in 1958 (Roberts). Such compilations have been useful for classifying published and unpublished documents concerned with expeditions to all far southern regions. It has also been of value to many persons engaged in a large variety of research about the Antarctic, especially where details of expeditions and investigations of a particular area were needed, notably for place-names. Users range from biogeographers, to political scientists, from geomagneticians to those engaged on studies of human effects on the region; even Librarians, catalogers and Archivists have apparently found it of use. Indeed such a basic list of activities in a specialized area has proven a very utilitarian work.

The list intends to record, as concisely as practicable, the history of discovery, exploration, exploitation, mapping, scientific investigation, administration, and some related subjects. Owing to the amount and diversity of information available it was impracticable to attempt to give due weight to the relative significance of each voyage or expedition. Thus many large and important ones are quite briefly recorded (there is much literature available elsewhere about these and recording the most basic detail is, I believe, adequate); conversely virtually unknown ones have been given more space as other sources are often effectively inaccessible. Notes about continuous and current national expeditions, mainly those after about 1945, can not claim to represent a summary of all the work accomplished by a particular expedition but are merely a description of some major features. In many cases routine meteorological, upper atmospheric, geophysical, and other programmes which have been undertaken continuously are mentioned only at their initiation - virtually every Antarctic station maintains a meteorological observatory. It is hoped that all stations open during the austral winters and all major traverses have been included. Other details in the compilation indicate where extra information may be sought.

The version of the chronology published in 1989 included a comprehensive index but the electronic data is accessible by a much larger range of determinants. Examples of these include: dates, purposes (sealing, exploration, tourism and several others), names of men and vessels, places, nationalities, sovereign claims and legislation, whaling statistics, winter stations, shipwrecks, Antarctic Treaty matters, and many others. It is practicable to prepare lists of all voyages to a particular place or a selection of these (all shipwrecks on the Prince Edward Islands, or all bases on King George Island, for instance).

Geography

One of the perennial, and very familiar, problems in the classification of polar regions is the definition of the boundaries of the Arctic and the Antarctic. I have taken a broad view of the latter; the peri-Antarctic islands as well as the continent, Antarctica, itself. This covers virtually all the area with which the Scientific Committee on Antarctic Research is concerned, all the territory under the aegis of the Antarctic Treaty, and the region defined by the Convention on the Conservation of Antarctic Marine Living Resources (south of a specified boundary approximating the Antarctic Convergence). The differences from the Scientific Committee's boundaries are that I have rejected Tristan da Cunha as it has been an inhabited place since 1810, and included Campbell Island and Auckland Islands (these appear to be informally included within the Committee's region).

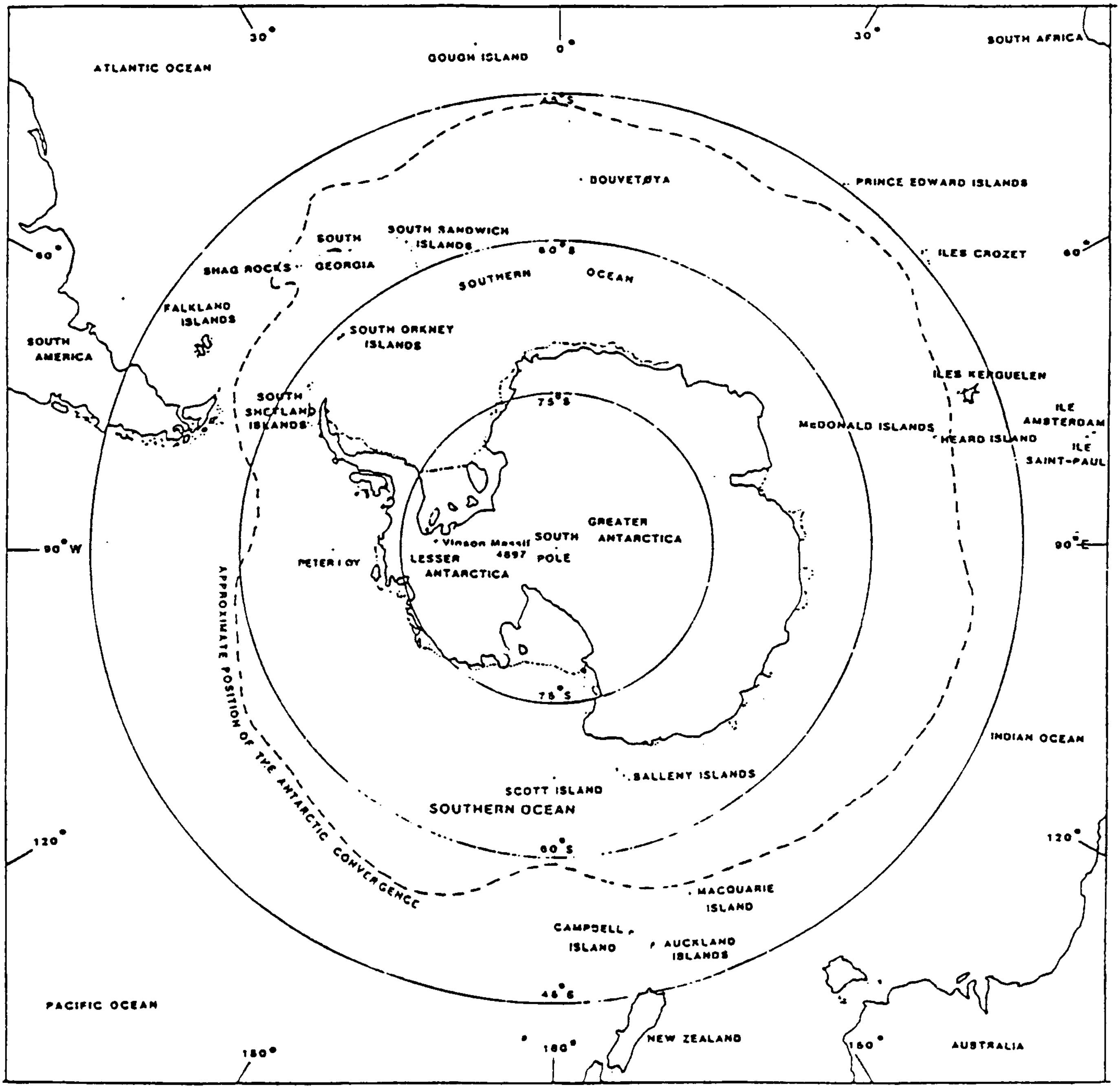
In addition some early voyages which discovered the far southern extremities of Africa, America, and Australasia as well as several islands (Tierra del Fuego, Falkland Islands, Tristan da Cunha, some New Zealand islands, and a few others) are included as these were involved in the southerly course of exploration. As these places became settled fewer details are included except for those of major events which affected the Antarctic. Their history forms several separate studies.

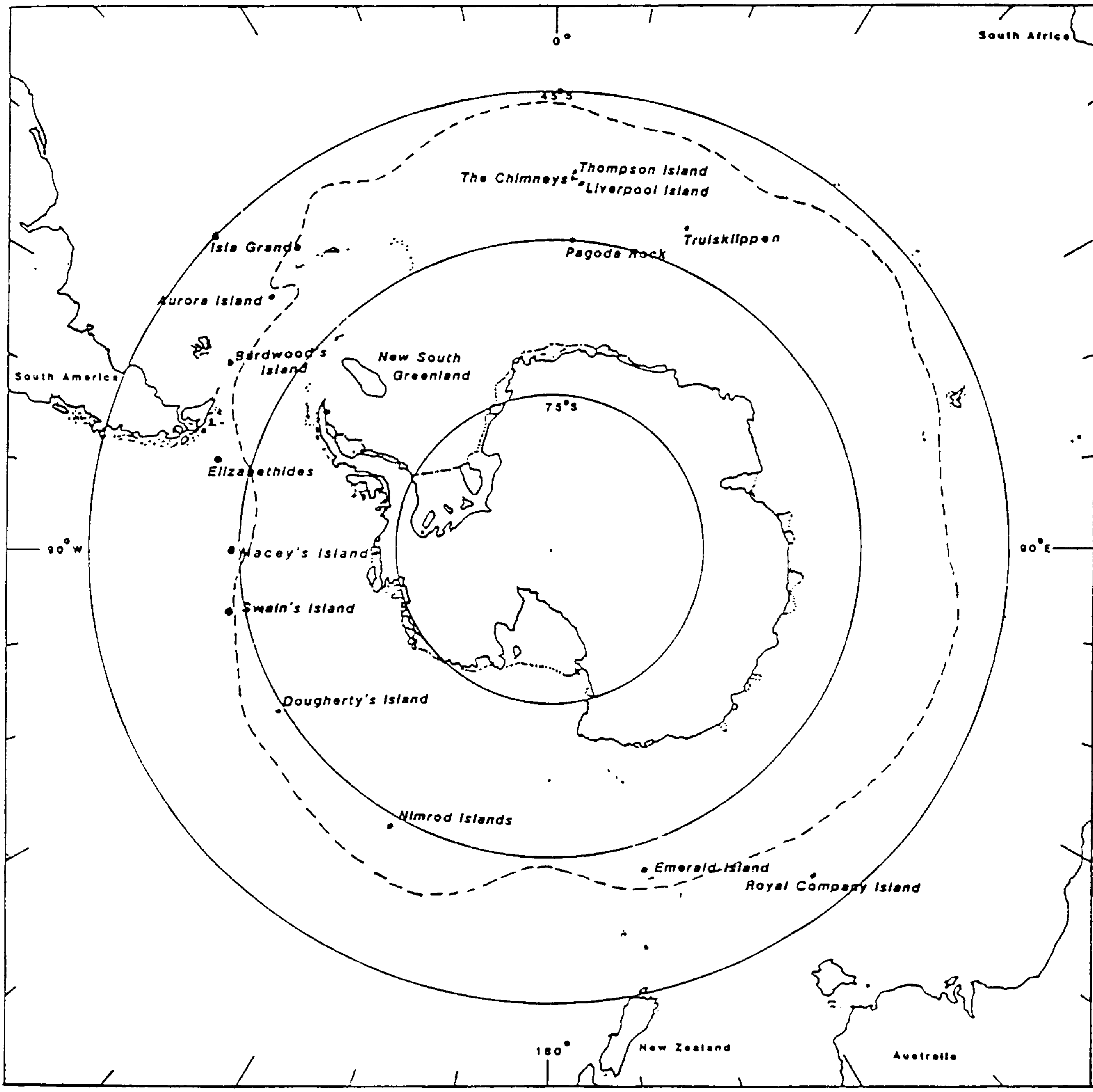
I will divert to discuss the pragmatic concept of peri-Antarctic islands (Ile Amsterdam, Auckland Islands, Balleny Islands, Bouvetøya, Campbell Island, Iles Crozet, Gough Island, Heard Island, Iles Kerguelen, McDonald Islands, Macquarie Island, Peter I Øy, Prince Edward Islands, Ile Saint-Paul, Scott Island, Shag Rocks, South Georgia, South Orkney Islands, South Sandwich Islands, and South Shetland Islands; map 1). This, I find, is a useful concept which includes a wider range of islands, with associated features, than those generally regarded as sub-Antarctic. Fully Antarctic islands such as the South Shetland Islands, Balleny Islands and others as well as some comparatively northern outposts, Gough Island, Ile Saint-Paul, Auckland Islands, and others are amongst them.

As well as all being far southern, isolated lands influenced by the rigorous climatic conditions of the Southern Ocean, these islands have comparable histories and cultural similarities in as far as the more accessible ones had an essentially equivalent association with the old sealing industry. All are currently unoccupied apart from scientific stations (although South Georgia, the South Shetland Islands, South Orkney Islands, Iles Kerguelen, and Campbell Island have sustained shore whaling stations). Their biology also presents an essentially similar development, with a progressive depauperisation as higher latitudes are reached.

Another geographic, and cataloguing, problem is the reports of a strange assortment of 16 non-existent, far southern islands (Aurora Islands, Burdwood's Island, The Chimneys, Dougherty's Island, Elizabethides, Emerald Island, Isla Grande, Liverpool Island, Macey's Island, New South Greenland, Nimrod Islands, Pagoda Rock, Royal Company Island, Swain's Island, Thompson Island, and Trulsklippen; map 2). All of these are in literature and most have appeared on charts. The majority are probably derived from the combination of a morainic iceberg, bad visibility, poor weather, and a tot of rum, others may be deliberately misleading reports by sealers hoping to confound their commercial opponents, and at least two of them may have once existed but were destroyed by volcanic explosions. While, for reasons of safety in navigation, any reported island or rock was included on charts until proven non-existent I was most surprised to note one has endured in a reputable work published in 1990. Swain's Island appears on chart 26 of the *Times' Atlas* - and someone has conscientiously drawn bathymetric lines around it (it was expunged from Admiralty Charts in 1920 and prior to that had 'E.D.' [existence doubtful] appended).

With Antarctica, the continent, there is no problem of pertinence, thus by far the largest subject of the chronology needs no commentary. To summarize the definitions adopted for the list the 'Antarctic' is regarded as all of the region south of the Antarctic Convergence; the 'Southern Ocean' as the circumpolar waters of that region; and 'Antarctica' as the continent itself, its ice shelves, and the off-lying islands (such as Adelaide Island, Joinville Island, Ross Island, Thurston Island, and many others). The peri-Antarctic islands lie to the north and to the south of the Convergence.


ATLANTIC OCEAN
GOUGH ISLAND
SOUTH AFRICA
BOUVETØYA
PRINCE EDWARD ISLANDS
SOUTH GEORGIA
SOUTH SANDWICH ISLANDS
ILES CROZET
SHAG ROCKS
SOUTHERN OCEAN
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
SOUTH AMERICA
ILES KERGUELEN
SOUTH SHETLAND ISLANDS
ILE AMSTERDAM
McDONALD ISLANDS
HEARD ISLAND
ILE SAINT-PAUL
GREATER ANTARCTICA
Vinson Massif 4897
SOUTH POLE
PETER I OY
LESSER ANTARCTICA
APPROXIMATE POSITION OF THE ANTARCTIC CONVERGENCE
INDIAN OCEAN
BALLENY ISLANDS
SCOTT ISLAND
SOUTHERN OCEAN
MACQUARIE ISLAND
CAMPBELL ISLAND
AUCKLAND ISLANDS
PACIFIC OCEAN
NEW ZEALAND
AUSTRALIA


0°
South Africa
45°S
Thompson Island
The Chimneys
Liverpool Island
Truiskilppen
Isla Grande
Pagoda Rock
Aurora Island
Bardwood's Island
New South Greenland
South America
75°S
Elizabethides
90°W
Hacey's Island
90°E
Swain's Island
Dougherty's Island
Nimrod Islands
Emerald Island
Royal Company Island
180°
New Zealand
Australia

History

Such a chronological list provides fairly clear indications of the development of knowledge of Antarctic regions. Six stages in the progressive exploration of, and other human activities in, the far south may be distinguished. For many purposes these form a useful classification, although overlap inevitably occurs. The following concise notes indicate stages of exploration which may usefully be distinguished and discuss problems with acquisition of data about them. The names I have applied reflect only the predominant theme of the period which may obfuscate many other activities; similarly the dates are but generalizations - there are no 'watertight compartments' in the historical continuum.

'Terra Australis' (-to 1780-)

The early period consists mainly of explorations and voyages penetrating to far southern regions. A consequence of this is the rapid reduction of the hypothetical 'Terra Australis' and continuous improvement of charts. There are compilations of voyages by De Brosses (1758), Burney (1803-17), Dalrymple (1770-71, 1775), and others which cover this period effectively. Investigation of archives held in the Netherlands, Portugal, Spain, several Latin-American countries, and elsewhere may continue to reveal more far southern voyages in these times. The work of Ricardo Capdevilla (1978) on the voyage of Gregorio Jerez in 1756 aboard *Leon* excellent example of this - acquired by much searching in the Archivo de las Indias in Lima. This period may be regarded as concluding with the voyages of Captains James Cook and Yves-Joseph de Kerguelen-Trêmarec.

'Sealing period' (-1780 to 1892-)

During the period from the publication of the accounts of the voyages of Cook (1777) and Kerguelen (1782) until early in this century the vast majority of visitors to Antarctic regions were sealers, who discovered many and visited nearly all the peri-Antarctic islands. The peak of the industry was early in the last century, as is shown in the histogram of their sailing years. Sealers, who were nearly all from Britain, Cape Colony, France, New South Wales, New Zealand, Tasmania, or the United States (New England states), made the first landings on Antarctica and were the first to winter in Antarctic regions (notably those who did so involuntarily on the South Shetland Islands, 1821 and 1877). During this period there also were exploring and scientific expeditions from many countries, several of which were associated with the Transit of Venus observations (1874) and first International Polar Year (1882-83). The first sighting of Antarctica was made by a scientific expedition in 1820 within this period.

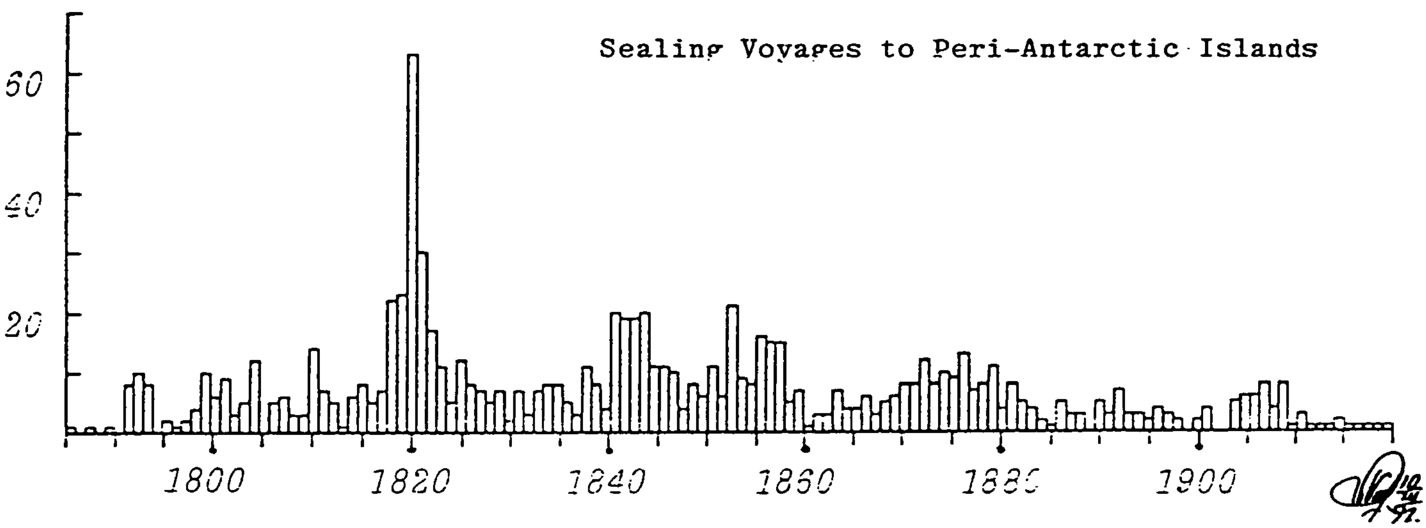
A particular problem with sealing voyages is that secrecy was a very important aspect of their enterprise. Should a master discover a new island with a large seal population he would report nothing and hope to return without competition next austral summer. This ensured that the contributions made to knowledge by many sealers are very imperfectly known. The sealers commonly complained that the seals moved elsewhere from a beach when exploitation became severe and they constantly searched for new islands - in truth the Fur Seals were nearing extinction. The earliest recommendations on Antarctic conservation are from 1788 at the beginning of this period (Headland 1989). Many sealers were not beyond 'spinning a yarn' to confuse competitors and perhaps the origins of a few of the non-existent islands are derived from this, as mentioned above. There are fascinating stories about buried messages, chalked notes beneath tables in Hobart's waterfront bars, bribes and violence to get information, and marooning to preserve it.

Of all the locations of sealers' ports the most active, those in New England, fortunately have the best preserved archives with material held several whaling museums and similar institutes. Several excellent compilations have made details of these easily accessible - in marked contrast to the records from Britain where, although a much more formal log was required, documents were burnt after 25 years. The compilations I generally found most helpful were contained in works by: Allen, J.A. (1899), Busch, B.C. (1980), Clark, A.H. (1887), Cumpston, J.S. (1963), Decker, R.O. (1973), Fonda, D.C. (1971), Hegarty, R.B. (1959 and 1964), Jones, A.G.E. (1986), Nicholson, I.H. (1977, 1983, and 1985), Pasquier, T.Du (1982), Schultz, C.R. (1965), Sherman, S.C. (1986), Stackpole, E.A. (1972), and Starbuck, A. (1878); several others were valuable in particular instances.

I have been able to extract details of almost 1000 Antarctic sealing voyages (diagram 1), a number which allows some analysis of the industry - and biology of the species involved. The sealing period was the first major epoch of the exploitation of Antarctic resources and has had profound effects on the biota of the region. This is however a subject for another paper but illustrates the use of historical material in interpretation of bio-dynamics of the Southern Ocean.

Two particular examples of acquisition of data from this period will serve to demonstrate some of the 'detective work' involved with sealers' voyages.

At Prince Olav Harbour on South Georgia is an isolated grave bearing the inscription: *John Anderson / Mate of Schr / Mary Jane of N York / Capt Joseph E Parsons / Died Nov 23rd AD 1838 / in this port on board / of the brig Medina / of N York Capt / Elijah Hallet / aged 36 years / An Honest Man.*
Which provides the dates of two vessels in that harbour. A note in a not well known journal the *British Packet and Argentine News* of Saturday, 2 November, vol. XIV, No. 689, Buenos Aires, 1839, gives a bit more information; *By letter sent from Colonel Cohen of the United States, dated 9 March 1839 at Rio De Janeiro, we have been informed that two vessels belonging to a Mr. Burrows of New York, the* Medina *and* Mary Jane, *during their recent voyage to the south Atlantic, rediscovered the Aurora Islands which number six and of which Mr. Burrows has made a drawing* (Fitte 1968). The investigation continues with an examination of the literature check; of all the voyage lists only Starbuck has any details, he lists *Medina* as sailing in 1835 from New York for Patagonia under the command of Captain Albertson, owned by S.E. Burrows, and last recorded at Rio de Janeiro 30 November 1839. I have not found *Mary Jane* in any of the lists.


Sealing Voyages to Peri-Antarctic Islands
60
40
20
1800
1820
1840
1860
1880
1900

The Aurora Islands sketched by Mr. Burrows are a non-existent group in the Southern Ocean frequently confounded, as in this case, with Shag Rocks. Many sealers searched for these groups - hoping that they would have beaches with abundant seals. There are about twenty references to their discovery and subsequent searches.

As well as giving a good example of correlation of very mixed details (graves, early South American newspapers, and voyage lists) this instance demonstrates the incompleteness of even carefully compiled published lists. The value of grave markers, inscriptions and the like on remote islands in confirming voyages is also demonstrated. I note that voyage details were often somewhat vague - the Customs sometimes used them for revenue purposes which, perhaps, affected their entire accuracy. Several other voyages may well be determined by similar investigation and correlation.

The second example concerns landings on Antarctica. By my count the claim to be 'first on the Antarctic continent' made by Carsten Egeberg Borchgrevink on 24 January 1895 is at least the fourth such landing (although Leonard Kristensen, A.H.F. von Tunzleman or both may have preceded him on that occasion [Evans and Jones, 1975]). Both Christopher Burdick and John McFarlane have good evidence for landing during the 1820-21 season on the Antarctic Peninsula (Stackpole, 1955; Jones, 1986). Borchgrevink may, however, have some contemporary justification for his claim in that, until 1936, it was uncertain whether the Antarctic Peninsula was archipelagic or part of the continent.

The third recorded landing (there were undoubtedly unrecorded ones by sealers, especially on the Antarctic Peninsula) is almost unknown. The log of *Levant* (1851-55), Captain Mercator Cooper from Sag Harbour, is preserved in the East Hampton Library (msXBG16) and reads for 26 January 1853:
at 8 Am the Ice / bearer insight together the high / Mountains back in the interier at 10 Am / pleasant breze at halfpast 11 Am we came / up with bearer and lowered a boat and / went to it and landed on it we saw / a number of penguins about the Ice the / Ice is here broken in large flakes and droven / soled together and a number of large bergs / mixed in the bearrer along the front / edge is from 4 to 15 feet [1•2 to 4•5 m] / out of the watter and / as it goes back it appears to be at consider / higher there is two or three peaks of / mountains a longway of and are very high / the atmosphere is tollerable Clear in / the Southward.
A sketch showing the Coast of the South Continent accompanies this text.

This example, a minor one from the point of view of Captain Cooper because he found no seals, is a significant and virtually unknown date in Antarctic history - the first landing on Greater Antarctica (although James Ross, John Biscoe, and Jules Dumont d'Urville had landed on off-lying islands of its coast).

'Continental exploration' (-1893 to 1918-)

The period from the first *Jason* (1892-93) voyage until the end of the First World War includes the expeditions of the 'heroic age' of Antarctic exploration with the beginnings of the modern whaling industry. The first winterings were made south of the Antarctic Circle (1898, aboard Belgica) and on Antarctica (1899, at Cape Adare). The last of the peri-Antarctic islands was discovered (Scott Island in 1902) and the general limits of Antarctica became known during this period. The earliest Antarctic cinematograph films and sound recordings were made in 1903. In that year the first permanent meteorological station was opened (on the South Orkney Islands) and in 1904 the first shore whaling station was established (on South Georgia). Colour photography was successfully used in 1911. The South Pole was reached twice in the 1911-12 summer (33 days separated these events). Radio communications were established between Antarctica and the rest of the world in 1912.

In contrast to the sealing period there are abundant records for this period - indeed the problem is more of too much material, over 160 primary published sources and at least 2000 archival ones for Captain Scott's material for instance. The overlap of the sealing period however, ensures several previous problems regarding data persist - the last New England sealing voyage to the Antarctic returned in 1922 (the first sailed in 1784).

'Whaling period' (-1919 to 1942-)

Thereafter, until the Second World War, the majority of vessels operating in the Southern Ocean belonged to the Norwegian whaling fleets and to scientific investigations associated with the industry (which started in the Antarctic in 1904). Other scientific expeditions of several nationalities were also active; several were assisted by the whaling fleets. Whalers were responsible for discovering many coastal regions of Antarctica, especially during the 1930-31 season when six shore stations, nine floating factories, and 32 factory ships operated with 232 whale-catchers. These took 40,201 whales and were the largest number of vessels ever to operate in the Southern Ocean, about 300 including transport ships.

Their numbers and distribution made discoveries inevitable. The captains of many of the whaling vessels confirmed or extended earlier reports of land: H. Halvorsen, of *Sevilla*, sighted land in the vicinity of longitude 14°E and named it 'Prinsesse Astrid Land' (now Prinsesse Astrid Kyst). Gustav B. Bull, of *Thorshammer*, sighted Prinsesse Ragnhild Kyst. On 12 January 1931 Arnold Brunvoll, of *Seksern*, sighted land between 64°E and 66·57°E. Reidar Bjerko, of *Bouvet II*, saw the same land on 19 January, and he was followed the next day by Carl Sjøvold of *Bouvet III*. Land could be seen from this vessel as far west as longitude 62°E. On 24 January *Bouvet III* again sighted land at 68°S, 74°E. The land from 65°E to about 60°E was also sighted by Rolf Walter, of *Thorgaut*. In February Lars Christensen, aboard *Thorshavn*, sighted Cape Darnley. Klarius Mikkelsen, of *Torlyn*, made landings at the south end of Mackenzie Bay and at 68·17°S, 69°E, naming the new territory 'Lars Christensen Land' (now Lars Christensen Coast). Arne Daehli, of *Hilda Knudsen*, sighted land between 60°E and 58°E. Otto Borchgrevink, of *Antarctic*, made sketch surveys of the coast of Enderby Land and Kemp Land between 59°E and 51·50°E, and of Kronprins Olav Kyst.

One of the ramifications of this activity was the Norwegian sovereignty over Peter I Øy, Bouvetøya, and Dronning Maud Land. Of the many new developments during this period one of the significant was that of the first successful use of heavier than air aircraft, a development which greatly facilitated inland exploration and mapping. There is much Norwegian whaling literature; Bogen, H.S.I. (1957), and Johnsen, A.O. and Tønnessen,J.N. (1959-69) are particularly useful sources, as was the whaling periodical, *Norsk Hvalfangst Tidende*, published in Sandefjord from 1912 to 1968.

'Permanent stations' (-1943 to 1958-)

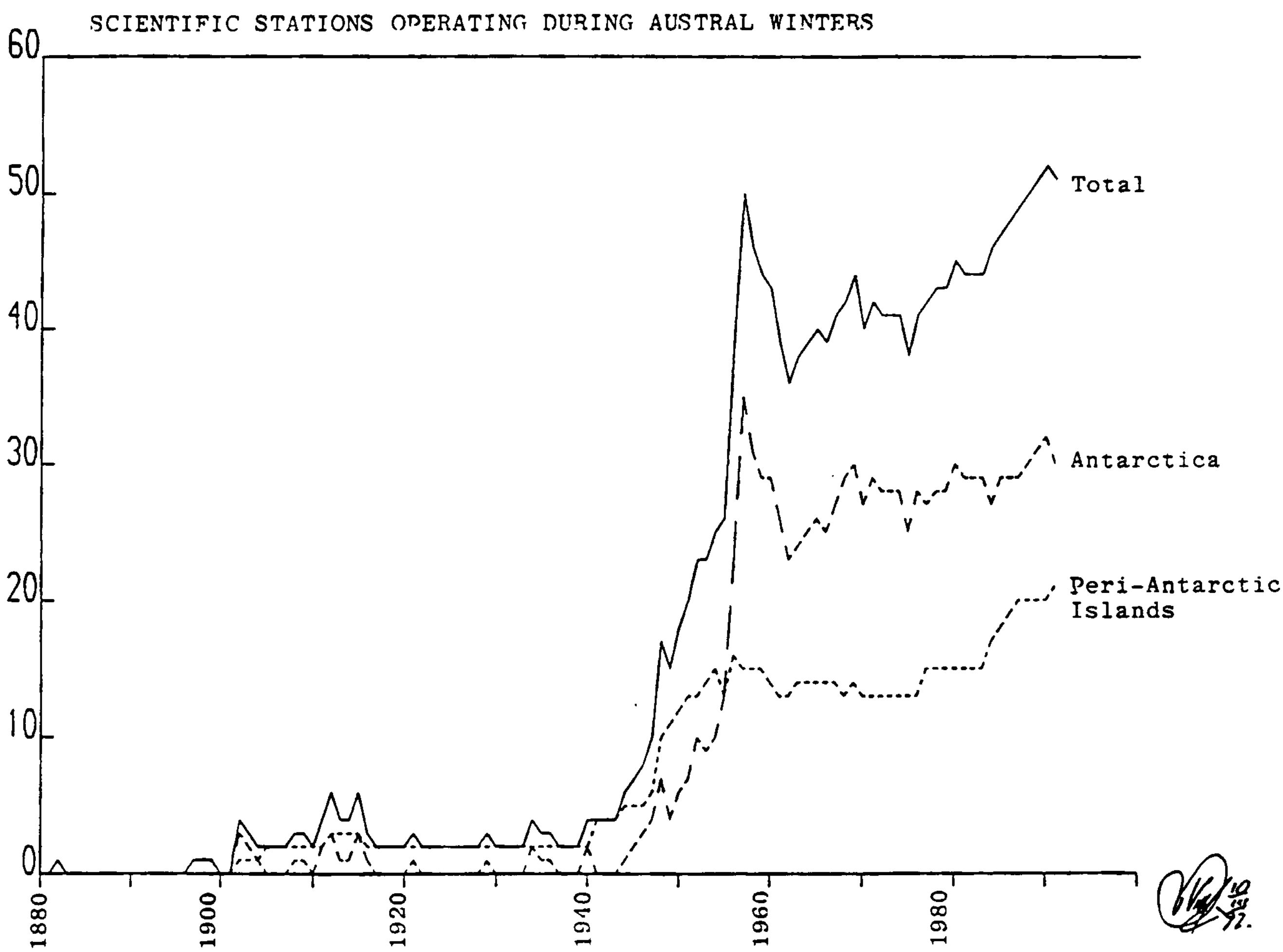
From the Second World War regular annual expeditions from an increasing number countries were the predominant activity. The permanent occupation of Antarctica started in 1943 at Port Lockroy (Wiencke Island) and 1944 (Hope Bay, Antarctic Peninsula). For most of this period no more than seven countries operated Antarctic winter stations and good published accounts appeared from all of them. We are also now well within the period of living memory; thus correspondence becomes one of the most efficient means of obtaining (and confirming) information.

The International Geophysical Year (1957-58), the third such event, was a major episode in the development of these activities when a cooperative concentrated research programme was undertaken by twelve countries deploying scientific stations in Antarctic regions. The histogram (diagram 2) showing numbers of winter stations in successive years illustrates this increase very effectively, in 1955, 26 winter stations were open in the Antarctic, in 1956 there were 39, and 50 in 1957, a number unequalled until 1989. The Scientific Committee for Antarctic Research was formed in 1958 and its constitution included provision for exchange of information about proposed Antarctic operations. The has been a most useful source for the chronology (especially as the Secretariat is in the Scott Polar Research Institute).

'Treaty period' (-1959 to current-)

The current latest division in the evolution of Antarctic history begins with the Antarctic Treaty which is partly a product of the International Geophysical Year. The Treaty has a requirement for exchange of information (Article III) about proposed scientific programmes and other subjects. The Treaty is bounded by the 60°S parallel (a legal rather than geographical constraint) whereas the limits of the Scientific Committee more closely approximate the region covered in the chronology. Scott Polar Research Institute holds a set of Treaty exchanges in the Archives.

There are two problems with the Treaty and Scientific Committee papers. One is the gulf between the theory of what is required and the practice of what a wide variety of states produce - most are good. The other is that the reports are of what is intended in the forthcoming year - Antarctic regions have a much greater occurrence of vicissitudes than average - so many intended reported activities are unsecure. Not all national expeditions


SCIENTIFIC STATIONS OPERATING DURING AUSTRAL WINTERS
60
50
40
30
20
10
0
1880
1900
1920
1940
1960
1980
Total
Antarctica
Peri-Antarctic Islands

are covered: thus Czechoslovakia has maintained a winter station on Nelson Island for four seasons but has not exchanged details as the Treaty requests (and is not a member of the Scientific Committee). Similarly Pakistan, a member of neither, does not formally report details of 'Jinnah' station.

Expeditions other than the national ones are a very variable lot. Some are explorationary with a substantial scientific component (Dr. Monica Khristensen's last two, for instance), some are to assert political aspirations (Greenpeace activities), many are commercial tourist cruises (which are larger operations than many small national expeditions), and there are many adventurers (private yachts and the several sporting or other recreational expeditions). Information about these comes mainly from personal contacts - some produce much publicity material and are easy to record, private yachts are difficult to trace but the Chilean authorities in King George Island, British administration at Port Stanley and King Edward Cove, United States records from 'Palmer' station, and some other sources help record them. Constant vetting of several journals as they are received by the Scott Polar Research Institute's Library is another source of useful data.

Perhaps the remoteness of Antarctic regions may be demonstrated by two examples during this most recent period. One is the first landing on the McDonald Islands on 27 January 1970 - we may recall that an analogous event occurred on the Moon on 20 July 1969. A second was that the first landing on Shag Rocks other than by helicopter was on 26 December 1991 from one of the increasing numerous tourist vessels.

Conclusion

A particular aspect of sources for the chronology, which I must mention while speaking at the Ohio State University, is my indebtedness to the work of and advice from Dr. Peter Anderson of the Byrd Polar Research Institute. His compilation of United States Antarctic activities continues from that of K.J. Bertrand (1971) and provides a most useful national record. Of the countries currently working in Antarctica only Australia appears to have a comparable set of electronic data - and this is less comprehensive.

In concluding I would like to acknowledge the help from many correspondents (some of whom are presently here) who have responded to my requests for information, corrections, additions, and other suggestions. These have been incorporated in the computer record and more are arriving; it is gratifying to receive such information - but it confirms my strong conviction of the difficulty in compiling such a record. For continued improvement in completeness and correctness such advice is indispensable - I would like to use this opportunity to request any extra details to promote this object and reiterate that the chronology is being revised continually.

As a final note I would like to inform you that a colleague, Clive Holland, also associated with the Scott Polar Research Institute, is preparing a similar chronology for the Arctic but, wisely, is halting at the time when the aircraft became a major exploratory vehicle after which too many northern journeys were made for it to be reasonable to be able to record.

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AN INTEGRATED SYSTEM FOR DESCRIBING ARCHIVES AND MANUSCRIPTS: IS THIS FEASIBLE FOR COLLECTIONS AT POLAR LIBRARIES?

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This paper considers archival and manuscript description as an integrated system. The paper is based primarily on Fredric M. Miller's new manual, *Arranging and Describing Archives and Manuscripts* (1990), part of the Archival Fundamentals Series of the Society of American Archivists, but Miller's work here is used to address the theme of integrating an archival descriptive program. Most of us as archivists prepare a variety of finding aids, but in our day-to-day work we may neglect considering how the finding aids can blend together to form a coherent descriptive program. Computers and word processors now make available powerful techniques which can aid us in integrating a descriptive system.

The starting point of a descriptive program is normally the in-house finding aid, which is prepared as the collection is arranged and described so that researchers may consult it effectively. In-house finding aids typically provide a biography or agency history for the creator of the collection; scope and content of the records actually present in the collection; descriptions of subgroups, series, and subseries; and container lists to the box or folder level.

A related aspect of a descriptive program may be brief descriptions of collections, usually made from the in-house finding aids. Such descriptions may appear in published guides to repositories, subject guides to specific collections housed in various repositories, and especially descriptions included in bibliographic utilities such as WLN and RLIN. Descriptions for bibliographic utilities must meet certain established standards. Library cataloging rules specify that such descriptions must have a main entry, which is usually the creator of the collection but may be in some circumstances the title of the collection. Principal names, places, and subjects may be used to establish additional points of access to the collection.

Finally, accession records, although they mainly serve other purposes, can also be part of a descriptive program. Accession records provide a rough preliminary form of description, used until more detailed descriptions or finding aids are prepared, which may not occur for many years. But objectives other than description are more crucial for accession records, especially gaining immediate physical, administrative, and legal control of incoming collections. Brief descriptions taken from accession records can be prepared for inclusion in bibliographic utilities. The minimum level of detail required to meet the standards for a bibliographic utility is a title statement, inclusive dates, and the quantity of material in the collection (Henson, 1989).

Archivists and manuscript curators are professionally trained to arrange material according to principles of provenance and original order. Since research requests frequently begin with subjects, a dilemma results. While archivists are trained to avoid subject arrangement of collections unless such a subject arrangement was imposed by the creator, technology now provided newer and more sophisticated means of linkage and subject access within a system of arrangement and description which retains whenever feasible the file order established by the creator. It is possible to prepare an in-depth subject index of a collection while preserving the existing arrangement, although archivists seldom take the time for such an elaborate system of access except for collections of outstanding significance or high demand. Most indexes are not in-depth, identifying only the most important names, places, and subjects which pertain to the collection as a whole. In addition, linking related collections by names, places, and subjects can be a vital aid for researchers trying to survey a repository's holdings.

Indexes and catalogs for collections may provide the principal mechanism for integrating a system of archival arrangement and description. An indexing system can be created separately in-house, or linked to a bibliographic utility such as WLN or RLIN. Principal names, places, and subjects for the index are drawn from the in-house finding aids, but for an indexing system to function effectively persons preparing descriptions of collections for the finding aids must have these indexes in mind.

Fredric Miller and other archivists who have written extensively about arrangement and description generally agree that the in-house finding aid is the key element of the descriptive program. Finding aids contain levels of description beginning with the collection (or record group), then proceeding to levels (or parts) within the collection: subgroup, series, subseries, folder, and (rarely) individual document. At the University of Alaska Fairbanks (like many comparable repositories) we strive for a finding aid that describes material to the folder level (for some collections description to the series or box level is sufficient), but we index or provide subject access only to the collection level. Bibliographic utilities are leading us to consider certain elements as standard in collection description: identification of records creator, information about intellectual content, intellectual access, physical description, and physical access.

The finding aid is the basis of archival description, becoming the basis for cataloging information, like the title page of a book is the basis of library cataloging. How does one extract indexing information (names, places, subjects) from the finding aid? Two methods are proposed, what Richard Lytle describes as provenance and content methods of information retrieval (Lytle, 1980). The provenance method goes to the folder headings in the container list for indexing terms. It is provenance based because it depends on the arrangement of the material as established by the creator of the collection. The content method works from the scope and content portion of the finding aid, the summary prepared by the archivist who arranges and describes the material. For the content method to work effectively, the archivist needs to include the important names and subjects as key words in the narrative. The provenance method is more mechanical and perhaps less flexible than the content method, but the content method may be quicker, for its container list can effectively stand alone without a scope and content section to provide an overall description of the collection. It may be possible to combine both the provenance and content methods, although the provenance method may be more suited to records of organizations and the content method to personal papers or historical manuscript collections.

At the Archives Section of the University of Alaska Fairbanks there is first a key word index, then brief descriptions of collections. The brief descriptions are compiled in a Guide to Manuscript Collections, and also edited for use, a gradual process, in preparing MARC AMC records. The key word index uses principal names and subjects in the collection. The final and most detailed level of description is a finding aid, which includes historical background and scope and content statements, series descriptions (if the collection is sufficiently large), and a container list showing the arrangement of the material in boxes and folders. Normally, when we arrange and describe a collection, the detailed finding aid is the first description prepared. The brief summary and the keyword index terms are derived from the finding aid. The ideal, which is not always followed, is to be conscious of the requirements of the brief summary and the index terms (keywords) while preparing the finding aid.

Archivists are aware of the major differences between historical manuscript collections and institutional records. Some of us work in true archives, as employees of the institution which created the records, and the records have always been in the custody of that institution. Others, like myself, work in repositories which mainly consist of historical manuscripts in diverse collections acquired from a variety of sources. Personal and family collections are most numerous in our holdings at the University of Alaska Fairbanks, which also include records of businesses, cultural and philanthropic organizations, and church records.

A major problem involved in creating an integrated system is developing a common vocabulary. This raises the issue of authority control of terms, using a common thesaurus to cover a variety of subject areas, including geographical names, Native peoples and cultures, anthropology, and the natural and physical sciences. As a repository which is part of a library, the Archives Section of the University of Alaska Fairbanks uses, as far as possible, the Library of Congress authority records for subjects and names. Reliance on a common vocabulary is especially necessary for working with a bibliographic database such as WLN. But there are limits to Library of Congress subject headings, especially for anthropology and Native studies. There are also difficulties in using the Library of Congress as the authority for place names. Therefore it is important to have sufficient flexibility to use a local vocabulary in situations where the national authority list is clearly inadequate.

Polar Libraries encompass a variety of libraries and special collections, involving differences in nationalities and cultures. But the growth of electronic databases is imposing a certain standardization in order to provide access. For example, in Alaska the main repositories for archives and/or manuscript collections include the State Archives, the State Historical Library (in Juneau), the Alaska branch of the National Archives, the Historical and Art Museum in Anchorage, and the historical collections at University of Alaska Fairbanks and the University of Anchorage. Beyond this are numerous libraries and historical societies which also care for historical collections.

Oral histories and photographs can also be described as collections using methodology devised by archivists and curators of historical manuscripts. For describing photographs the ideal is to strive for control at the image level, but for many collections it may be useful to consider the collection level rather than the image as the appropriate level for description, especially where the collections are enormous and the subject matter repetitive. For example, in a collection of the research of a wildlife biologist, it might be appropriate to lead the researcher to photographs of bears taken during several summers of field work. General descriptions of the places and times in which the field work occurred could be provided, but the researcher would then need to examine the un-indexed images of bears.

Special descriptive problems are involved when considering collections created by or pertaining to Native peoples: administrative records, photographs, oral histories, and manuscript collections. Vastly different cultural perspectives exist concerning the nature of archives, especially for collections created by tribes, Native corporations, Native elders, and other Native groups and individuals. Archivists face a danger of imposing strategies for written documents on cultures with mainly an oral tradition, cultures which may not share many of the assumptions in which most of us as archivists were trained.

Also significant is a developing process of merging various professional traditions: archives, historical manuscripts, and more recently, methodology developed by museums. In the United States for many years the leadership for work with manuscripts came from the Library of Congress and for archives from the National Archives. But with the creation of the Society of American Archivists Basic Manual Series, beginning in 1976/1977, a major step occurred towards a merger of methodology concerning archives and historical manuscripts, and this was enhanced in the early 1980's with the development of the MARC AMC Format for cataloging archives and manuscripts for inclusion in bibliographic databases. The blending of museum and library/archival descriptive systems is proceeding more quickly as both professions turn to computers and discover common descriptive elements for working with objects and with documents.

Since polar libraries encompass such a variety of special collections, institutions, and even professional traditions and methodologies, is it possible to develop a theoretical framework to support a system to integrate our descriptive process? Archivists, like most professionals, seek principles which can be universally applied to all collections and all institutional settings. It is desirable that such principles be based on quantification, so that bias on the part of individual practitioners can be avoided. Frank Boles attempted to develop a mathematical mechanism to help evaluate records in the appraisal process, in which archivists decide which records should be saved and which should be destroyed. quantification could not accurately predict record value, and the main reason for this, according to Boles, is that archivists from different types of institutions evaluate records differently (Boles, 1991). This suggests that archivists may also describe records differently, depending on the type of institution holding those records.

At the outset this paper posed a question of whether an integrated system is feasible for describibing archives and manuscripts at polar libraries. The paper considered ways of thinking about how the elements of a descriptive program can be linked. But the work of Frank Boles on appraisal and what we know about the variety of collections and institutions, even among our smaller community of polar libraries, suggests a note of caution. Attempts at integration of our descriptive practices should allow for sufficient flexibility to accommodate this variety, avoiding the uniformity of rigid standards.

But what about developing an integrated system for all polar libraries? In effect, we are already integrating our description to some degree as we contribute collection records to bibliographic utilities such as WLN and RLIN. Perhaps we could do this more consciously through having a session at a future Polar Libraries Colloquy concerning the MARC AMC Format (and possibly parallel formats used in other countries). We might consider creating a common thesaurus of subjects and names pertaining to the polar regions, especially in areas where we recognize that existing thesauri are particularly weak. A start could be to have one library serve as a clearinghouse for our "non-standard" names and subjects.

Another step, once a sufficiently large number of collection descriptions have been prepared for bibliographic utilities, would be to compile these descriptions into a printed guide or a separate database. In conclusion, then if the polar libraries are to create a truly integrated system for archival and manuscript description, this will occur as a result of more conscious use of existing resources and networks, rather than an attempt to deliberately create an entirely new system. In other words, change here occurs through a process of evolution instead of resulting from a radically different design.

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DOCUMENTATION STRATEGY AND THE ARCHIVAL CHALLENGE OF POLAR EXPLORATION AND SCIENTIFIC INVESTIGATION

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Abstract

Polar exploration, scientific investigation and the dissemination of knowledge have been a trinity. Many of the early explorers included scientists and publicists in their expeditions. In the modern era, the process of investigation has involved not only scientists but also governmental agencies, research institutes, associations, and universities as sponsors and facilitators. Typically, those who work to broaden the base of knowledge of polar regions are members of a community where the contributions of one begin with and add to those of many.

Archivists who have the challenge of identifying, preserving, and making available original materials that document the history of the knowledge of polar regions are as hard-pressed as librarians to keep up with information providers and users. This paper will discuss documentation strategy and its relevance to polar librarians and archivists.

Introduction

Lewis Thomas, an observer of modern science, commented, "An active field of science is like an immense anthill. The individual almost vanishes into the mass of minds tumbling over each other, carrying information from place to place, passing it around at the speed of light."[1]

Of course, not all scientists like to be compared to insects. Nevertheless, the metaphor of the anthill is useful in describing the distinctive features of modern science, or "Big Science" since World War II. In modern science, investigation typically results from research projects undertaken by teams or "colonies" of scientists. Because projects require financial support from a sponsor, government or private, requests for proposals from sponsoring agencies, like signals from the "queen ant", guide the direction of scientific inquiry. Meanwhile, scientists exchange ideas and information among themselves in journals, technical reports, meetings, and telecommunications. All of these exchanges foster additional research -- more trips up the metaphorical anthill.[2]

What follows has several parts. First, polar science will be discussed as it represents the characteristics of modern science. Second, those characteristics, in turn, pose challenges to archivists in their mission of identifying, preserving, and making available the documents of modern science. Finally, documentation strategy, a recent development in archival literature, will be examined as a potential way of dealing with the archival records of polar science. In all the parts, the questions outnumber the answers. This, however, is true of at the beginning of most projects, scientific as well as administrative.

POLAR SCIENCE AS "BIG" SCIENCE:

Nowhere are the distinctive features of modern science more apparent than in polar regions. Travel to the extremities of the earth requires both teamwork and expense. Scientists need special equipment that is capable of surviving the extremes of temperature and the hazards of the environment. As a result, most scientific investigation is sponsored and team-oriented. Reports and data find their way to polar databases, data centers, and polar librations within institutional centers of research. The polar scientist working entirely alone is as rare as "Big Foot."

Polar science challenges archivists by raising several questions. If scientific activities occur within the context of a sponsored project and a team of researchers, then the records in the possession of a single scientist may not be sufficient to document the workings of science. To what extent did the wishes of the sponsor tailor the project? Who has the most comprehensive or significant documentation of the research project--the principal investigator, the research institution, or the sponsor? Where is the data compiled by the project? Those are but a few of the questions that modern science poses.

Antarctica is a particulary troubling example of the archival problems of documenting modern science. If Antarctica is the continent of science, as has been said, how does an archivist deal with the records produced in this very active theatre of scientific investigation? The numbers of scientists engaged in research is one problem. Another is that the work of science there has enlisted scientists from many disciplines, government agencies, and research foundations, public and private. Thus, the archivist of in polar regions faces a stage in which many plays and many players are performing simultaneously.

Preserving materials for long-term use and making them available has always been an expensive undertaking. A fundamental question is how archivists decide which of the many scientific projects merit extensive documentation. How does one determine "significance" when so many disciplines have research in Antarctica and contribute to the advancement of knowledge?

These issues should concern all who engage in polar work, not archivists alone. Science, it must be remembered, takes place within a larger social and cultural context that includes non-scientists. Answers to questions about the documentation of polar science are important to those voters and tax-payers who question the merits of continuing financial support for scientific research in polar regions. Explaining and documenting polar science serve to counter those who would exploit these areas for purely commercial reasons. If scientific research in polar regions is worthy of support, then the documentation of scientific enterprize and its contribution to science and technology are worthy of preservation for posterity.

Polar librarians and data custodians may have a different question. Is not the abundance of literature and of data from and about polar regions, sufficient evidence of science in polar areas? Actually, what the articles, books, and data represent are the results of scientific activity, not its record. A full record would include the full sequence of events from hypothesis to testing, to false start, to reshaping the hypothesis, to information sharing.[3] As C.P. Snow put it"...if we could follow the process of scientific thought through many minds, as it actually happens and not as it is conventionally expressed after the event, we should see every conceivable variety of mental texture."[4] Only by documenting the scientific process of discovery in all of its dimensions is it possible to show that the ways of science are rarely simple or direct.

DOCUMENTATION STRATEGY:

Documentation strategy has been defined as "a plan to assure the adequate documentation of an on-going issue, activity, function or subject."[5] Its goal is to assure adequacy of historical information by involving many individuals and many institutions in a coordinated effort. Documentation strategy begins with the premise that no single historical agency has adequate resources to identify, preserve, and make available its collecting objective. Historical agencies with similar collecting missions develop plans of cooperation that avoid duplication or competition.[6] This is nothing new for librarians who have participated in bibliographic networks and shared information about printed resources for many years.

What is different, however, is that documentation strategy also involves the creators and users of information. Creators bring to the collective effort a first-hand knowledge of what kinds of information is being developed by whom and in what format. Too often, archivists and librarians have had to react to information without knowing its social and historical context. Sometimes, archivists and historians find that the creators of information have destroyed documents needed for the context of a scientific project. Preventive measures are possible. For example, a records retention and disposition schedule for a company engaging in arctic research could direct that some records--research project files and the like-- have a permanent retention or historical review. Another possibility would be to influence the company to become an archival repository or to microfilm records of historical value. Another concern best handled at the beginning by the creator are electronic records that may become unreadable as hardware and software change.

Users take part in documentation strategy by helping to determine the topics of long term value. Professional historians are a prominent constituency of users. Also valuable for support are the many amateur historians and people interested in history who can offer assistance. Increasingly, scientists use historical information for current information.

In the end, the goal of users, information providers, and creators, is to create a plan of action that brings together and coordinates limited resources efficiently. As a strategic plan, the document identifies what actions are to be taken by whom and when. Periodically, the plan itself is reviewed and reevaluated as needs and circumstances change.

Documentation strategy proceeds in stages. What follows will relate the stages to the circumstance of polar science. The purpose here is not to present an operational plan. It is to relate documentation strategy in a general way to the challenge of preserving the record of sicne in polar regions. Actual applications of documentation strategy may be different in different areas.

In the first stage, interested parties--information providers, users, and creators-- come together to define the scope of the plan. In this case one could envision a colloquoy of polar librarians, archivists, curators, along with scientists, historians, and government agencies. All have a common interest in the advancement of knowledge of polar regions.

Defining the scope of the project is a fundamentally important activity. Returning to the original metaphor, what and where is the "anthill"? Geographical definitions are one approach.[7] Is it viable to focus activities within a specific area--North Pole, Antaractica, Greenland or smaller areas? As envisioned at this point, all scientific investigations taking place within the designated area would become the target of documentation strategy. This has the advantage of involving multiple disciplines within a single geographical area. Thus, all scientists and scientific investigations--glaciology, climatology, geology biology and others that are common to a specific area--would take part in the project. The central question to raise is: "how has the study of this place advanced scientific knowledge?" Geographic documentation projects have already been undertaken or discussed for Western New York, a highway in Massachusetts famous as a location for the computer industry and for Milwaukee.

Not all science fits neatly into geographical settings. Another way of setting limits to the documentation project may be to focus on separate disciplines rather than regions. Thus, the "anthill" is defined according to a particular type of ant. For example, one could document all meteorological investigations in polar regions without limiting the project to a specific area. This has the advantage of simplicity. The subjects and the type of activity to be documented and the types of records themselves might be similar.

There are examples of this approach to documentation strategy. The Society for the History of Physics and the Center for the History of Chemistry seek to document the work of scientists and projects in a specific discipline.[8] Of polar regions one might ask "how have polar regions advanced knowledge in meterology?" Unfortunately, this approach ignores the inter-disciplinary nature of scientific investigation. It imposes the artificial boundaries of 19th century professionalism upon the multi-disciplinary nature of modern science.

A third means of mapping the "anthill" is to document the activities of the centers of scientific research involved with polar areas. This has the advantage of reaching beyond a specific geo-political domain and embracing a variety of scientific disciplines. It would also facilitate connections from the records of individual scietists to related records in the research centers. One of the strongest arguments for this strategy is that the centers have a history of cooperation and interaction, as manifested by the biennial meetings of the Polar Libraries Colloquy. Could the Colloquy serve first as a forum for a discussion of polar strategy and then as a vehicle for gathering interested parties in an archival enterprize? Only time will tell.

After the limits of the documenting area are set, other questions follow. Who will the members of the documentation strategy team be? Will there be a single player who will serve as a chair? Is there an institution willing to host meetings and assist in other ways? What information and expertise will be needed for putting together a plan of action? [9] The success of any committee depends upon the willingness of its members, the clarity of its charges, and the support of institutional sponsors.

Having identified the players and the theatre of action, the next stage begins. This is the collecting of information that will provide the basis for the plan of action. Numerous questions need to be answered. What scientific investigations are taking place? Who is doing them? What records are created in the process? What records exist in which historical repositories? How do the collections and collecting policies of the historical repositories relate to one another? Are there activities, topics, or projects not adequately represented in the collections of historical repositories?

To answer these questions it is critical that the strategy team include subject experts in deciding what projects deserve the most archival attention. It is very likely are more documents than can be maintained or preserved. Hard choices have to be made. The point here is that the process of developing a documentation strategy gathers the expertise needed to make those choices.

Fortunately, the documentation of polar science can benefit from two significant works that can guide in the selection of records. In 1979 the National Historic Publications and Records Commission awarded a grant to the Joint Committee on Archives of Science and Technology. This group consisted of representatives of the History of Science Society, the Society of American Archivists and the Society for the History of Technology. Their report "Understanding Progress as Process: Documentation of the History of Post-War Science and Technology in the United States" is central to the evaluation of records documenting the scientific process. Another report, entitled "Appraising the Records of Modern Science and Technology: A Guide," built on the work of the Joint Committee and offers additional guidance to appraising scientific documentation. Together, both works provide an excellent over-view of the scientific process, the types of records generated, and the long-term value of which records.

In the end, the goal of the documentation group is a plan of action for members of the group and for external parties. A few possible courses of action are worth mentioning. For example, the documentation group may discover that a foundation or a research agency has no records program to manage its administrative and its laboratory records. The group could recommend, encourage, or facilitate the creation of one that also identifies records of historical interest. These, in turn, could be maintained by the agency or transferred to a historical repository.

The plan of action can address many other questions of documentation. For example, academic scientists typically move from one college or university to another. Do they take project files with them? What guidelines exist at which institution to determine what is institutional and what is private? If the researcher's papers are considered private, is there a local repository willing to assume responsibility for them? The Center for the History of Physics has accomplished much by alerting historical agencies and scholars to the existence of valuable records at repositories or in private hands.

Another recommendation could refer to the maintenance and transfer of data files. What forms are these files in? Do they merit permanent retention? How is this to be done most efficiently?

Because the concern of the documentation group is for science, it must also deal with the technology of discovery. What devices were used to undertake the measurements and observations? Are these worthy of long-term preservation? How should this be done?

Typically, polar scientists contribute to scientific journals. Do the journals that publish widely of polar research have records programs that document the decision-making process? The likelihood of publication is a major incentive for scientific investigation and the advancement of the careers of scientists. Then, too, the archivist of polar science should be concerned about electronic bulletin boards that serve as forums for the exchange of information and ideas. Who has responsibility to document this and how?

Private associations have done much to focus popular attention upon polar regions. Do these associations recognize the historic value of their records? Do historical repositories have arrangements with polar associations for the maintenance and preservation of organizational records? More often than not, private societies have no central office, frequent changes in officers, and consequent losses of materials. Only active guidance from a historical agency can remedy the situation that results from informality.

Finally, not all activities or projects have adequate documentation. This is an area for oral history, which is the creation of a record of the past by means of interview. Ideally, oral history should follow a careful analysis of the existing documentation and extract information that is not available elsewhere. There should be a clearly identified need that the expensive and time-consuming processes of oral history are worthy of undertaking.

Documentation strategy has its critics.[10] Even the experiment of developing a documentation strategy for six counties in Western New York was not a complete success.[11] It is time-consuming and difficult to bring together and coordinate people from multiple institutions and backgrounds. This is the nature of any collaborative enterprize. In this context, the pervasiveness of telecommunication facilities at research institutions--from electronic bulletin boards to conference calls--can link archivists, librarians, and scientists in distant places and make coordination possible.

Another charge is that historical repositories are hard-pressed to meet current needs. Many information providers represent one-person shops with little more than clerical support, if that. To expect an under-staffed, under-funded archival agency to undertake an extra-institutional task such as the documentation of a research project or the papers of a scientist who had no connection with the institution is unrealistic.

To this the defenders of documentation strategy argue that one of the advantages of a coordinated plan that involves creators and users as well as providers is that it increases the likelihood of support by expanding the number of players. This support might be caused by influencing an information provider to change a practice or to accept some responsibility for documentation that had not existed before the formation of the group. Another incentive is the prospect of external support from government agencies and private foundations for those who participate in a collaborative effort. This has been the case with several of the examples of documentation strategy.

The most persuasive argument for documentation strategy is the inadequacy of traditional archival practices. In the context of polar science, archivists and archival agencies cannot adequately perform the traditional tasks of documentation without the support of others. Big science is simply too big for small archives. Archivists of polar science need more than cooperation of equally under-funded historical agencies in a financial climate of diminishing resources. They need a strategy that links information providers with creators and users to establish priorities and find ways to identify, preserve, and make available the historic record of modern science. Documentation strategy in some form may be the answer.

NOTES

1. Bartlett, John. *Familiar Quotations: A Collection of Passages, Phrases and Proverbs Traced to Their Source in Ancient and Modern Literature*. 15th edition, Boston, Little Brown and Company, 1980, pgs. 883-884.

2. The process of modern science is well described in *Understanding Progress as Process: Final Report of the Joint Committee on Archives of Science and Technology*. Elliot, Clark A., *editor*. Chicago, Society of American Archivists, 1983, p. 35.

3. *Understanding Progress as Process*, p. 12.

4. Quoted in Hass, Joan K., Samuels, Helen Willa, and Simmons, Barbara Trippel. *Appraising the Records of Modern Science and Technology: A Guide*. Chicago: Society of American Archivists, 1985, p. 83.

5. Hackman, Larry J. and Warnow-Blewett, Joan. The documentation strategy process: a model and a case study. *The American Archivist*, **50**(1), 14.

6. There is a growing body of archival literature about documentation strategy. Most useful are Cox, Richard J. *American Archival Analysis: The Recent Development of the Archival Profession in the United States*, Metuchen, N.J., Scarecrow Press, 1990, p. 291-303; Cox, Richard J. A documentation strategy case study, Western New York, *The American Archivist*, **52**(2), p. 192-200; Cox, Richard J. and Samuels, Helen W., The archivist's first responsibility: a research agenda to improve the identification and retention of records of enduring value. *The American Archivist*, **51**(1 & 2), 28-42; Alexander, Philip N. and Samuels, Helen W. The Roots of 128: A hypothetical documentation strategy, *The American Archivist*, **50**(4), 518-531.

7. Examples of the geographical approach are Alexander, Philip N. and Samuels, Helen W. The roots of 128: a hypothetical documentation strategy, and Cox, Richard J. A Documentation Strategy Case Study: Western New York.

8. Hackman, Larry J. and Warnow-Blewett, Joan. The documentation strategy process: a model and a case study, p. 29-42.

9. Hackman, Larry J. and Warnow-Blewett, Joan. The documentation strategy process: a model and a case study, p. 21.

10. Critics have also been adding to the archival literature about documentation strategy. See Abraham, Terry. Collection policy or documentation strategy: theory and practice. *The American Archivist*, **54**(1), 44-52; Boles, Frank. Commentary. *The American Archivist*, **51**(1 & 2), 43-46.

11. As a whole, Richard Cox felt that the experiment of documentation strategy was worthwhile, but it did not achieve its orginal objective, the developing and implementing of a written plan of documentation activity for six counties in New York.

POLAR ARCHIVAL RECORDS: A MODEST PROPOSAL

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"There is likewise another great advantage to my scheme..."
J. Swift, *A Modest Proposal* (1729)

Abstract

In recent years, great advances have been made in the capture and availability of bibliographic and analytic records of printed polar materials. One major category of research material, however, has not been addressed. This is the tremendous body of archival and manuscript records in repositories throughout the world. A researcher has little hope of finding necessary and appropriate primary research material unless those records are in the select few institutions that have published catalogs or inventories. In a vital institution, the catalog is out of date even before it leaves the printer as more records are added to the repository holdings each day.

This paper proposes an international cooperative effort to locate, identify, catalog, and make available to researchers bibliographic records of polar archival and manuscript holdings in repositories throughout the world. It outlines the current state of the question, current problems encountered by researchers, a framework for organizing the effort, and a standard for the bibliographic record. The final product would be made available in electronic format. The consequences of such an effort would be an international guide to polar archival and manuscript holdings. Such a tool will be of enormous benefit to the scholarly research community.

Introduction

One of the more pressing problems that faces any researcher is the need to find primary research material on the subject in question. This problem has been with us since the first researcher walked into the first library back in the depths of time. The problem has been compounded over the centuries by the rapid growth in holdings of libraries. It is no longer useful to expect that a handwritten register of materials will be sufficient for a researcher's needs. We all have received, perhaps on a weekly basis, "shotgun" letters from researchers desperately seeking the papers of a person or on a subject.

The need for comprehensive access to Arctic and Antarctic data has been long understood. In the United States, there is legislation which recognizes the need.[1] This legislation created the United States Arctic Research Commission which, in 1989 documented information needs.[2] Perhaps the clearest and most cogent argument for a systematic attempt to gather and make available data on the Arctic regions was made by Juan Roederer in his keynote address to the Twelfth Northern Libraries Colloquy in 1988. In his speech, Dr. Roederer argued that an international system is critically necessary if we are to understand and wisely use the Arctic.[3]

Access to polar information is a problem. For a seasoned researcher, there are tools that she or he can use. For the student, or someone new to the discipline, the difficulties can be insurmountable. In one standard reference tool, there are thirty-six institutions in the United States and Canada that claim to have holdings relating to one or both poles.[4] The brief notes in this work do not really give much information and would, if nothing else, require a letter or phone call to the institution to clarify details.

There are, to be sure, databases that can be of assistance to the researcher seeking printed information. In the United States, for example, there are the resources of several bibliographic utilities. These include RLIN, the Research Libraries Information Network of the Research Libraries Group; OCLC, the database of OCLC, Inc.; and WLN, the database of the Western Library Network. These are national utilities that have records of both printed and archival material added to them on a daily basis and, consequently, are the most current source of information. These databases in the United States have their counterparts in other nations.

A second major resource are databases that are specifically designed for the polar researcher. A number of these databases have been supported by federal funds and by academic institutions in the United States and Canada and are the result of the work of dedicated librarians. Examples of these include COLD, ASTIS, Boreal Northern Titles, and BOREAL. Access to these can be obtained directly or through networks such as OMNET/SCIENCEnet. Of particular interest to polar researchers are the two CD-ROM products that have been produced recently. PolarPac is the result of the work of several members of the Colloquy and can be obtained through the Western Library Network. It is

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[1] The Arctic Research and Policy Act, PL98-373, of 1984, and amended as PL101-609, of 1990, specifically details the important interests of the United States in the Arctic and further identifies the fragmented and uncoordinated approach to vital information.

[2] United States, Arctic Research Commission, *Arctic Data and Information: Issues and Goals, Findings and Recommendations of the U.S. Arctic Research Commission*, Issue 3 (June, 1989). This is the most comprehensive statement of U.S. information needs for Arctic research. It includes potential goals and products.

[3] Juan G. Roederer, "Toward an Arctic Data and Information System," Twelfth Northern Libraries Colloquy, 5-9 June, 1988, in *Glaciological Data, INSTAAR Special Publication GD-22* (August, 1988), 22-38.

[4] Lee Ash, compiler, *Subject Collections* (6th ed.; New York: R.R. Bowker, 1985), s.v. Arctic, Antarctic, North Pole, South Pole.

a not-for-profit product that contains monographic records from a number of US polar libraries and the serials holdings from 38 polar libraries from throughout the world. Arctic and Antarctic Regions CD-ROM is a commercial venture, produced by the National Information Services Corporation of Baltimore, Maryland. This is a comprehensive database that contains over 400,000 citations, many of which have abstracts.[5] The importance of these electronic formats cannot be overstated as resources for researchers.

The Current Situation

The problem, however, remains with the need to find polar archival and manuscript records. This problem is compounded by radical changes in the user population. There was a time in the not too distant past when archival materials were the sole preserve of historians of the polar regions, primarily historians of exploration. This has now changed and researchers from a multitude of disciplines are seeking historical information. Archaeologists, ethnologists, anthropologists, environmental researchers, and physical and biological scientists are realizing the importance of the historical record. They do not, however, have easy access to the these materials.

If historians know, or think they know, how and where to find archival records, other researchers do not. Historians once searched records for the names of expeditions or names of principals involved in the expeditions. Other researchers are asking quite different questions and are finding it very difficult to find records that will provide them with the appropriate answers.

There are, to be sure, printed guides to many collections and types of collections. These are often of great use and importance to a researcher who is aware of their existence. An excellent recent example of intellectual access to the papers of one individual is the remarkable guide to the papers of Douglas Mawson published by Adelaide University.[6] Genre catalogs, such as that for whaling logs and journals, are also of assistance to the researcher.[7] Depending, then, on the type of information sought and its location, it is sometimes possible to discover relevant material. Often the researcher is required to backtrack through footnotes to find materials. In other cases, the "old-boy" network can be used to find records. And there is always serendipity.

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[5] See Martha Andrews, "Computerized Information Retrieval and Bibliographic Control of Polar and Cold Regions Literature: a Review," *Bulletin, Special Libraries Association, Geography and Map Division*, 159 (March, 1990), 21-42, for an excellent summary of work to date.

[6] M. Innis and H. Duff, compilers, *Mawson's Papers* (Adelaide: Mawson Institute for Antarctic Research, 1991).

[7] Stuart Sherman, compiler, *Whaling Logbooks and Journals, 1613-1927. An Inventory of Manuscript Records in Public Collections*, revised by J.M. Downey and V.M. Adams (New York: Garland Publishing, 1986).

The difficulty lies with the skewing of research. Topics are often selected simply because the researcher knows where the potential research materials are housed. In other cases, only part of the evidence is used as the remainder cannot be located. The potential for research that leads to erroneous conclusions is great.

Partial solutions to the problem exist. In the United States, the AMC (Archives and Manuscripts Control) file of the RLIN database contains many records of use to polar researchers. The limitation of the file lies in the narrow list of institutions adding records. Many of the more important repositories holding polar records do not belong to the Research Libraries Group. A second important tool is the National Union Catalog of Manuscript Collections and its recently published name index.[8] NUCMC is one of the more useful tools for locating materials in U.S. institutions. It is, however, voluntary which means that many institutions, particularly smaller repositories, have never listed holdings in the catalog.

One of the more interesting and important groups of polar records is to be found in the National Archives. This body of records are gift collections relating to polar regions. If a researcher was not aware that the primary U.S. federal archival agency had the authority (granted by the Acts of Congress in 1950 and 1952) to accept gifts of non-federal polar records, these important collections could easily be overlooked.[9] Other federal records of interest to the polar researcher are, of course, listed in this useful guide. Finally, in the United States, there is an important move to make guides to individual bodies of papers more available. One exciting example of this is the recently published guide to the Sir Hubert Wilkins papers held by the Byrd Polar Research Center.[10]

In Canada, steps have also been taken to insure the accessibility of records. One of the more important collections of Arctic records is held by the Hudson's Bay Company Archives. Many if not most of their records are available on microfilm and they have also provided a useful interlibrary loan finding aid.[11] Access to the rich holdings of the National Archives of Canada can be found in its general inventory of manuscripts. This

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[8] U.S. Library of Congress, *National Union Catalog of Manuscript Collections* (Hamden: Shoe String Press, 1959-), and *Index to Personal Names in the National Union Catalog of Manuscript Collections, 1959-1984* (2 vols.; Alexandria: Chadwyck-Healey, 1988). It should be noted that NUCMC records are now being entered into the AMC file of the RLIN database which makes RLIN an even more important research tool.

[9] *Guide to the National Archives of the United States* (rev. ed.; Washington: National Archives and Records Administration, 1987), Record Group 401.

[10] The Ohio State University, Byrd Polar Research Center Archival Program, *Register of the Sir George Hubert Wilkins Papers, Record Group 56.6*, compiled by Kenneth M. Grossi (Columbus: Byrd Polar Research Center, 1991). This is an excellent example of processing and guide preparation that could serve as a model for other institutions.

[11] *Hudson's Bay Company Archives Interlibrary Loan Finding Aid* (2 microfilm reels; Winnipeg: Provincial Archives of Manitoba, 1988). Researchers should also consult Alex Ross and Anne Morton, "The Hudson's Bay Company and Its Archives," *Business Archives*, 51 (November, 1985), 17-39, as an important introduction to this collection.

guide has the added advantage of noting the availability of a collection level guide to each of the bodies of records.[12] Finally, and perhaps most important, there is the union list of Canadian manuscripts that is prepared and kept relatively up-to-date by the National Archives and the Humanities Research Council of Canada.[13] This is one of the more useful national registers available.

In the United Kingdom, there are many guides and aids that are particularly useful to researchers. Chief among these are the series of lists and indexes produced for the Public Record Office holdings. These include Admiralty Records and Colonial Office Records as two examples of the tools available to the scholar. The general guide to the Public Record Office holdings is a model of its kind.[14] Three other repositories, each with excellent guides to holdings, need also to be cited. The British Library, one of the largest manuscript repositories in the world, contains many collections of interest to the polar scholar.[15] So, too, does the National Maritime Museum in Greenwich.[16] Finally, one of the most important collections in the world is to be found at the Scott Polar Research Institute. The Guide to that institution's manuscript holdings is excellent not only for the clarity of information, but also for the cross-references to holdings in other repositories throughout the world.[17] One often overlooked but exceptionally useful tool, if the researcher has the patience and stamina to read through each of the annual issues, is the list of accessions to repositories as reported to the Royal Commission on Historical Manuscripts.[18] If the data from this series, now published since 1956, were codified and made available, it would make research in the United Kingdom much easier.

The final example of potential research tools for manuscript location is that of the former Soviet Union. Problems that were critical in the past have been compounded by recent

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[12] National Archives of Canada, Manuscripts Division, *General Inventory, Manuscripts* (Ottawa: Information Canada, 1971-). Of particular importance are MG 29 and MG 30 which contain 19th and 20th century polar records.

[13] *Idem, Union List of Manuscripts in Canadian Repositories* (Ottawa: National Archives of Canada, 1975-).

[14] See, for example, Great Britain, Public Record Office, *List of Admiralty Records,* List and Indexes, Supplementary Series, No. 6 (8 vols.; London: HMSO, 1966-); and *idem, List of Colonial Office Records*, Lists and Indexes, Supplementary Series, No. 16 (6 vols.; London: HMSO, 1976). For a general guide to the PRO, see *Guide to the Contents of the Public Record Office* (3 vols.; London: HMSO, 1963-1968).

[15] British Library, Department of Manuscripts, *Index of Manuscripts in the British Library* (10 vols.; Cambridge: Chadwyck-Healey, 1984-1986). This index is the easiest and most efficient method of accessing the numerous British Library manuscript catalogs.

[16] National Maritime Museum, *Guide to Manuscripts in the National Maritime Museum*, edited by R.J.B. Knight (2 vols.; London: Mansell, 1977-1980).

[17] Clive Holland, editor, *Manuscripts in the Scott Polar Research Institute: A Catalogue*, Garland Reference Library of Social Science, Vol. 123 (New York: Garland Publishing Co., 1982).

[18] The current annual register, begun in 1972, is Great Britain, Royal Commission on Historical Manuscripts, *Accessions to Repositories and Reports Added to the National Register of Archives* (London: HMSO, 1972-). Its predecessor, from 1956 to 1971, was Great Britain, National Register of Archives, *List of Accessions to Repositories* (London: HMSO, 1956-1971).

events that cloud our understanding of access to polar records. One scholar has noted that research in Russian archives can be, "something of an obstacle course to Western historians."[19] There are a number of important tools that do provide at least some intellectual access for Western researchers. One is a guide prepared by a group of Russian academicians designed as an introduction for Western scholars to the libraries of the academies of science in the Eastern European nations.[20] By far the most important and most useful work has been done by Patricia Kennedy Grimsted of Harvard University. In a series of guides and handbooks, she has provided massive amounts of information regarding many of the Russian archival repositories.[21] Particularly useful have been Dr. Grimsted's periodic bibliographical essays that allow the reader to remain current and to understand changes in archival practice.[22] As the acknowledged Western expert on Russian archives, Dr. Grimsted continues to provide up-to-date information on a rapidly changing archival arena.[23] While there is no overall intellectual access to Russian archives, it is possible to begin to understand their archival system and to make educated guesses concerning the location of certain classes of records. It is, however, difficult at best to attempt to locate manuscript and archival records in Russian repositories.

It should be evident by this point that there are great difficulties in any attempt to do research using polar archival and manuscript records. Unless a researcher is already aware -- by personal knowledge, by finding an appropriate guide, or by serendipity -- of the location of polar materials, it is often the most difficult part of the research project. It is doubtful if many archivists or curators in polar collections go through a day without a letter,

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[19] Lynne Viola, "Archival Research in the USSR, A Practical Guide for Historians," in *A Researcher's Guide to Sources on Soviet Social History in the 1930's*, edited by Sheila Fitzpatrick and Lynne Viola (Armonk: M.E. Sharpe, 1990), 65-83, at 65. This article should be treated as a preface to any attempt to work in Russian archives.

[20] *Directory of Libraries and Information Centers of the Academies of Sciences of Socialist Countries*, edited by V.A. Filov (Moscow: Nauka, 1986).

[21] Patricia Kennedy Grimsted, *A Handbook for Archival Research in the USSR* (Washington: Kennan Institute for Advanced Russian Studies, 1989), and *idem, Archives and Manuscripts Repositories in the USSR: Moscow and Leningrad* (Princeton: Princeton University Press, 1972), are two key handbooks. Dr. Grimsted has also attempted to gather as many archival finding aids as possible and to make them available in microform. These have been published by Inter Documentation Company of Zug, Switzerland, since 1976 with the first of the series being *Archives and Manuscript Collections in the USSR: Finding Aids on Microfiche, [Series 1]: Moscow and Leningrad.*

[22] See, for example, *Archives and Manuscript Repositories in the USSR, Moscow and Leningrad: Supplement: Bibliographical Addenda*, Bibliotheca Slavica, 9 (Zug: Inter Documentation Co., 1976), and *Recent Soviet Archival Literature: A Review and Preliminary Bibliography of Selected Reference Aids*. Kennan Institute Occasional Paper, No 204 (December, 1986).

[23] "Archival Resources from the 1920's and 1930's, Soviet Archival Developments and Reference Aids for the Social Historian," in *A Researcher's Guide to Sources on Soviet Social History in the 1930's*, edited by Sheila Fitzpatrick and Lynne Viola (Armonk: M.E. Sharpe, 1990), 26-64. This essay is the best short introduction to Soviet archival practice and terminology. See also her essay, "*Perestroika* in the Archives? Further Efforts at Soviet Archival Reform," *American Archivist*, 54 (Winter, 1991), 70-95, for the most recent changes in Russian archives.

telephone call, or site visit from a researcher asking if the records of a person or expedition are located in the repository or, if not, where they are located. As the use of polar records changes and requests for data become more complex, this problem will multiply. Polar archivists and curators are now at a point where decisions must be made that will affect their repositories for many years to come.

The Solution

The solution to the problem of finding polar archival and manuscript records is quite simple. We must provide immediate, current, and accurate information to researchers and we must do it now. This can be accomplished by an international effort to locate, identify, catalog, and make bibliographic records of polar materials available in an electronic format. This must be done using a standard format that can be readily used to create records by curators and archivists and a standard format that will also provide appropriate information to the researcher.

This is not as daunting a project as it may first appear. Some of the building blocks for such an undertaking are in place. The RLIN database of RLG contains some polar manuscript records already, including those of the Stefansson Collection at Dartmouth College. These will be complemented by the inclusion of NUCMC records as they are added to RLIN. The efforts of the U.S. Polar Bibliographical Information Working Group, described by Martha Andrews in the proceedings of the Thirteenth Polar Libraries Colloquy, are moving toward a national database of material in the United States. Other important efforts were described at that same Colloquy. These include the work of Vladimir Putilov on a regional approach, Susan Barr on the very important plan of the Norsk Polarinstitutt for a Norwegian national database, Carl-Edvard Edvardsson on a parallel effort for Swedish archival materials, and a very important essay by William Mills and Ronald Inouye on a much needed geographic thesaurus.[24] One further Colloquy essay ought to be noted. This is the seminal work of Kerstin Elam on creating a database from a guide to a body of papers at the Scott Polar Research Institute.[25] This essay lays important groundwork for adding the full text of guides to collections to any bibliographic database of polar records.

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[24] Martha Andrews, "Resource Sharing Among U.S. Providers of Polar Information," 48-51; Vladimir Putilov, "Data Bases (DB) and Knowledge Bases (KB) in Regional Arctic Research: The Problem of Organization and Effective Application," 16-18; Susan Barr, "Data Base for Historical Material from Norwegian Polar Areas," 60-62; Carl-Edvard Edvardsson, "The Source Material of the Archival Institution to the History of the Arctic Regions," 71-74; and William J. Mills and Ronald K. Inouye, "Towards a Polar Thesaurus: Geographic Indexing for an International Polar Bibliographic Database," 157-161 all in *Man's Future in Arctic Areas, Proceedings of the 13th Polar Libraries Colloquy, 10-14 June, 1990*, University of Lapland, Arctic Centre Publications, I (1990).

[25] Kerstin Ullström Elam, "Making a Database from the Accessions List of the Richardson-Voss Papers at the Scott Polar Research Institute Library Using dBase III," Twelfth Northern Libraries Colloquy, 5-9 June, 1988, in *Glaciological Data, INSTAAR Special Publication GD-22* (August, 1988), 315-319.

What is perhaps most exciting is the vital work that has been done by Robin Minion and Ross Goodwin on a Canadian Polar Information System. In a series of background studies and a design paper, they have resolved many of the issues that would confront any such international effort and provide the technological infrastructure for a polar archival database.[26] The work of our colleagues, while focused on Canada, is theoretical and can easily be translated for use internationally.

It should be evident that many of the building blocks necessary to accomplish an international database of polar records are in place. The focus, however, has been national and we are dealing with two areas of the world -- at opposite poles -- that are international in importance and, for the most part, without national boundaries. It is time to consider polar manuscript records from an international perspective.

The format for any such undertaking must be uniform. The obvious solution is the use of the MARC format, an internationally recognized standard for machine-readable records. With minimal variation, the MARC format is used by many if not most of the nations that would be involved in such a project. There are several reasons for selecting MARC. It is flexible in that it can be modified and used to a greater or lesser extent depending on the needs of the project. It is efficient in that it can exchange data quickly, neatly, and efficiently. It is rapidly becoming the standard format for bibliographic data internationally. Thus, the MARC format serves to provide the intellectual architecture for quality data gathering, sharing, and transfer.

The record structure for all bibliographic data for the project must be agreed upon at the outset. It must provide all necessary information for archivists and curators and, at the same time, be useful to researchers at every level of expertise. We must all supply the same data using the same fields in the format in order to expedite the exchange of information. One such proposed standard is outlined in the appendix to this paper. It has the advantage of providing both mandatory and recommended fields so that it maintains the necessary flexibility for describing many varied types of records. It is also a tested record standard that has been used in other archival projects that work with a multitude of record types.

The organization of this effort must be international in direction and yet national in focus. The responsibility for data gathering for each nation's polar records, whether they are in public or private institutions, must rest with curators and archivists in the nation itself. Each nation should organize the effort as it sees fit. The data gathering could be done voluntarily

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[26] *Final Report, Background Study on Subject and Geographic Access Methods for a Canadian Polar Information System* (Calgary and Edmonton: AINA and Boreal Institute for Northern Studies, 1989), *Final Report, Background Study on the Organizational Structure of a Canadian Polar Information System* (Edmonton and Calgary: Boreal Institute for Northern Studies and AINA, 1990), *Towards a Design for a Canadian Polar Information System* (2nd ed.; Calgary and Edmonton: AINA and Boreal Institute for Northern Studies, 1990), and *Final Report, Background Study on the Needs of Potential Users of a Canadian Polar Information System* (Calgary and Edmonton: AINA and Canadian Circumpolar Library, 1991).

via questionnaires, by site visits, by searching existing databases and printed catalogs, or by a combination of the three methods. At the same time, there must be an international secretariat to provide for overall coordination. This secretariat must be under the aegis of a recognized international body such as this Colloquy, the International Council on Archives, or UNESCO. The secretariat would be responsible for assisting each nation in obtaining funding for the effort, for general operations, for quality control of data, for transferring the data to tape or disk, and for disseminating the final product.

The final product, in the first instance, would be a master tape of all polar archival and manuscript records. This would be continually added to and refined as more records are acquired and made publicly available. This master tape could be mounted on the main frame of any national system that would want to have it. Further, the records also ought to be available on CD for institutions that would not have access to a national database. Since there are two excellent and appropriate CD's currently in use with polar data on them -- PolarPac and Arctic and Antarctic Regions -- these are the logical disks to hold, in the first instance, the data from this project. It should be stressed, however, that any nation or body that desires copies of the data ought to have access to it. It is not recommended that plans be made for a printed version of the data. This is not a project that is conducive to print format in that the data cannot be manipulated and the data will be immediately out of date when the printed product is made available.

The cost of the effort will be great, both in terms of financial and time resources. A best estimate of the immediate financial costs will be in the range of $6 million (USD). The time element is more difficult to determine. As long as polar records continue to be created or placed in repositories, the project will not be completed. A target of the Seventeenth Polar Libraries Colloquy in 1998 is not unreasonable.

Conclusion

Why undertake a project such as this? First, we have an obligation to make materials available to researchers in the broadest sense of the word. We cannot simply assume that researchers will know where materials are located or rely on the knowledge of a few old hands. We must provide access to researchers at all levels of interest and use so that all data relating to a research project can be found and that these records can be found in a timely manner. One added advantage is that collections that are now fragmented and held in several institutions would be bibliographically and intellectually reunited.

Second, such a project would provide currency for the researcher. As soon as records enter the repository, a bibliographic record could be generated and added to the database. No longer would researchers wait for years to obtain a supplement to a manuscript catalog, if one were to appear at all. The project would never be out-of-date and would never be closed. A permanent, low cost secretariat would insure this.

Electronic access to polar archival and manuscript records would guarantee access to the wealth of information contained in them. It is time that we made these records available.

APPENDIX

Polar Archival and Manuscript Records: A Standard

The following standard is proposed for the creation of bibliographic records in a project to develop an international database of polar archival and manuscript records. In order to accomplish the goal of providing information concerning holdings of these materials in libraries throughout the world, a standard must be recognized. In addition to mandatory fields, this standard also recommends the use of certain fields that will be of use to researchers. Mandatory fields are marked in the left-hand column as (M), mandatory if applicable (MA), and recommended as (R).

In general, collection-level records will be created. It is not the intent of this project to create item-level records unless a single item is the only material of an author held by the repository. In some cases, it will be necessary to create collection-level records for the project where a repository has chosen to catalog on an item-level basis.

In general, photocopies or microforms of manuscript material located in other institutions will not be catalogued as part of this project. The exception to this is when the photocopy or microform forms an integral part of a collection relevant to the project.

Cataloging Rules

1. The standard cataloging authority is Steven L. Hensen, Archives, personal papers, and manuscripts: a cataloging manual for archival repositories, historical societies, and manuscript libraries (2nd ed.; Chicago: Society of American Archivists, 1989).

2. In the cases where Hensen is not applicable, Anglo-American Cataloging Rules, 2nd. ed., 1978, and its supplements, will be followed.

3. All 1XX, 6XX, and 7XX entries shall conform to LCSH, NAF, or SAF, as applicable.

Fixed Fields

Standards for fixed fields shall be those identified as standards in the Research Libraries Group AMC format (RLG Standard for Use of the AMC Format, Document 85-67).

Variable Fields

M	040	Cataloging source. Subfield "a" should contain the NUC symbol of the library performing the cataloging. Subfield "e" should indicate that Hensen's manual is being followed by including the code for the manual: "appm".
M	1XX	Main entry.
M	245	Title statement, in either subfield "a" or "k".
M	245	Subfield "f," inclusive dates.
R	245	Subfield "g," bulk dates.
M	300	Physical description.
M	300	Subfield "a," extent.
M	300	Subfield "f," type of unit.
R	351	Organization and arrangement.
MA	506	Restrictions on access.
R	510	Citation note (brief form), if applicable.
M	520	Summary, etc.
R	524	Preferred citation.
R	530	Additional physical forms available, if applicable.
MA	540	Terms governing use and reproduction applied after access is provided.
R	545	Biographical or historical note.
R	546	Language note.
R	555	Cumulative index/finding aids note, if applicable.
R	561	Provenance, if applicable.

R	580	Linking entry complexity note, it applicable, to be used in conjunction with 773 field.
R	6XX	Subject added entries. Strongly recommended to allow researcher to narrow and define searches.
R	655	Genre/form. If this field is used, the source of the heading should be cited. Genre Terms. A Thesaurus for use in Rare Book and Special Collections Cataloging (2nd ed.; Chicago: ACRL, 1991) is recommended. If used, it should be identified in subfield "2" as "rbgenr".
R	7XX	Added entries. Strongly recommended to permit access by correspondent, uniform and variant titles, etc.
R	773	Host item entry, if applicable, to be used in conjunction with the 580 field.
M	851	Location.

- POSTER SESSION -

THE BYRD POLAR RESEARCH CENTER ARCHIVAL PROGRAM: THE PAPERS OF REAR ADMIRAL RICHARD E. BYRD AND SIR GEORGE HUBERT WILKINS

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The Byrd Polar Research Center Archival Program (BPRCAP) was founded in 1990 as a collaborative program of the Byrd Research Center and the Ohio State University Libraries. The University Archivist serves as Archivist of the BPRCAP and is a member of Libraries and the Center. The purpose of the BPRCAP is to identify, preserve and make available the papers of explorers and scientists who have studied the polar regions. The core collections of the BPRCAP are the papers of Rear Admiral Richard E. Byrd and Sir George Hubert Wilkins. In addition, BPRCAP has the papers of other scientists who have investigated the polar regions.

The papers of Rear Admiral Richard E. Byrd contain more than 600 cubic feet of manuscripts, photographs, newspaper clippings, audio tapes, motion picture films, scrapbooks, printed material, and artifacts. The collection came to the Ohio State University in two parts, the first in 1985 and the second in 1990. In the spring of 1992, the Byrd Polar Research Center Archival Program was awarded a two-year grant from the United States Department of Education to process the Byrd Papers. A project archivist and student support staff will be hired for this project which will commence in October of 1992. Currently, part one of the Byrd collection has a preliminary container and folder level inventory and part two has a preliminary container level inventory. These inventories are available for researchers to review.

Rear Admiral Richard Evelyn Byrd was born in Winchester, Virginia on October 25, 1888. He graduated first from the Virginia Military Institute and then from the naval academy at Annapolis. Byrd learned to fly in 1917 and spent his early years in the United States Navy working on aeronautics projects. Byrd's accomplishments in polar exploration began in 1926 with his flight to the North Pole with pilot Floyd Bennett. In 1929, during the first Byrd Antarctic Expedition, Byrd and three of his expedition crew members flew over the South Pole. During this expedition, Byrd's base *Little America* was constructed. In 1933, the Second Byrd Antarctic Expedition began. During the winter of 1934, Byrd manned the weather observation post Bolling Advance Base by himself. He nearly died of carbon monoxide poisoning from a faulty stovepipe but was rescued in August 1934 by members of his expedition. Byrd's book, *Alone*, is the story of this experience at Bolling Advance Base. In 1939, Rear Admiral Byrd was given command of the United States Antarctic Service and he returned to Antarctica for the third time. This expedition began government sponsorship of explorations. During World War II, Byrd served on several missions to help establish air support for ground troops and to locate sites for air stations. In 1946, Byrd was appointed "Officer in Charge" of Operation Highjump in Antarctica. In 1955, he returned to Antarctica for his fifth and final time as a member of Operation Deep Freeze. Richard Byrd received many honors for his accomplishments in polar exploration. He gave lectures and presentations about his work and was the author of books and articles. Rear Admiral Richard E. Byrd died on March 11, 1957.

The other core collection of the Byrd Center Archival Program is the papers of Sir George Hubert Wilkins. This collection came to the Ohio State University in two parts, the first in 1985 and the second in 1988. The Wilkins collection contains approximately 175 cubic feet of manuscripts, photographs, scrapbooks, newspaper clippings, sound recordings, motion picture film, printed material, and artifacts. The Wilkins collection has been arranged into series and a register for the collection is available for researchers to review.

Sir George Hubert Wilkins was born in Mt. Bryan East, South Australia on October 31, 1888 (six days after the birth of Richard Byrd). Wilkins studied engineering at the Adelaide School of Mines in Australia. At an early age he took a keen interest in photography and flying. In 1912, he was a photographer and news correspondent during the Balkan War. In 1913, Wilkins was hired by Vilhjalmur Stefansson as a photographer for an Arctic expedition. During World War I, he served as a photographer for the Australian Flying Corps in France. From 1919-1922, Wilkins participated in expeditions to Antarctica; serving as a naturalist for the Sir Ernest Shackelton Expedition, 1921-1922. From 1923-1925, Wilkins spent time in Northern Australia and adjacent islands studying the environment and the aborigines while collecting flora and fauna samples for the British Museum. During the Wilkins-Detroit Arctic expeditions, 1926-1928, Wilkins and Ben Eielson flew a Lockheed Vega from Point Barrow, Alaska to Spitzbergen in the Norwegian Archipelago. This was the first transArctic airplane flight. From 1928-1930, Wilkins explored Antarctica under the sponsorship of William Randolph Hearst. During these expeditions, Wilkins and Eielson made the first airplane flight over Antarctica (December 1928). In 1931, Wilkins commanded the submarine *Nautilus* to the Arctic Sea. This was the first submarine to travel beneath the Arctic ice. During 1930s, Wilkins was second-in-command of four Antarctic flight expeditions which were led by American Lincoln Ellsworth. In 1937, Wilkins commanded an international rescue team which was searching for lost Soviet aviators in the Arctic Circle. From 1942 until his death in 1958, Wilkins was a consultant to the United States Military in the areas of hot and cold weather clothing and survival techniques, aviation and submersible craft research, Arctic defense, and geographic and geologic research. He returned to the polar regions several times during his work for the U.S. Military. Wilkins received many honors for his work in the polar regions. He was also an accomplished photographer and a pioneer in aero-cinemagraphics. He spent much of his career lecturing about his work and he was the author of many articles and books. Sir George Hubert Wilkins died on December 1, 1958. The United States Navy paid a great tribute to Wilkins and his achievements by taking his ashes to the North Pole and scattering them on the Arctic ice on March 17, 1959.

The Byrd Polar Research Center Archival Program continues to work to document the exploration of polar regions. Reference activity is handled by the Ohio State University Archives staff. In addition, the Byrd Polar Research Center houses the Goldthwait Polar Library. This library contains papers, monographs, reports, and articles which document scientific research and historic events in the polar regions.

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The Sir George Hubert Wilkins Papers. The Ohio State University, Byrd Polar Research Center Archival Program. Columbus, Ohio 43210.

- POSTER -

HUDSON'S BAY COMPANY ARCHIVES NITRATE NEGATIVE PROJECT

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When George Eastman introduced cellulose nitrate film in 1889, he helped make photography easier for enthusiastic amateurs - such as Company employees.

Like much modern technology, however, nitrate film, which remained in use to ca. 1950, has proved something of a mixed blessing. Inherently unstable, its deterioration results in the eventual loss of image information and potential damage to other archival material stored nearby. Spontaneous combustion is the most serious (and notorious) result of the deterioration of nitrate film.

Archivists and conservators who care for nitrate film are faced with some perplexing choices. There are solutions for the problems posed by nitrate film; none of them is easy - or cheap.

In November 1991 The Hudson's Bay Company Archives, Provincial Archives of Manitoba, began work on the Hudson's Bay Company Archives Nitrate Negative Project. Jointly funded by the Conservation Plan for Canadian Archival Records (CPCAR) of the Canadian Council of Archives, the Provincial Archives of Manitoba and a trust fund established by the Hudson's Bay Company to help with the work of the Archives, the six-month Project continued the on-going task of identifying nitrate negatives, placing them in cold storage and producing copy negatives of the most important images. Information on the negatives (including the stage of deterioration reached) is entered in a data base. This will assist in monitoring of the negatives over the long term.

Photos:

Top - Intern Evan Kroeker in the Conservation Laboratory, PAM
Middle - Conservator Shelagh Linklater testing negatives
Bottom - CPCAR contractor Marcia Boey making mylar storage folders

Credit: Marcia Boey. Photo of Marcia Boey by Evan Kroeker

- POSTER -

JAMES CANTLEY COLLECTION

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A native of Aberdeen, James Cantley (1895-1969) worked in and for the North as an HBC employee (1913-1938), free trader (1939-1950) and civil servant (1950-1956). The Cantley collection in the archives numbers some 567 images (1914-1951), nearly all of which are on nitrate film.

Cantley's portrait photographs show great respect for their subjects, a respect further demonstrated by his careful captions.

Photos:

Top - "Koolelah & Mattoo and Eskimo children at Lake Harbour, about 1915. Mattoo (r) was father of Simonie ... Koolelah & Mattoo were chore boys at Lake Harbour." (HBCA Photo Collection, 1987/257/N508.)

Bottom - "Adam, skipper of *Nannuk*; Matthewsie ...; Mukkevik, substitute pilot at Lake Harbour; Moosa, member of crew *Nannuk* on trip from Lake Harbour to Cumberland Gulf ... in 1921." (HBCA Photo Collection, 1987/257/N279.)

- POSTER SESSION -

BRITISH ANTARCTIC SURVEY - ARCHIVES

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1 Origins of the British Antarctic Survey

The United Kingdom's interest in Antarctica and the surrounding oceans started over two centuries ago with Captain Cook's expeditions, and always had a scientific component. Exploration and observation became more systematic after 1923 with the inauguration of a series of expeditions under the Government-sponsored Discovery Committee.

The origins of the British Antarctic Survey (BAS) itself lie in Operation Tabarin, a naval expedition organised during the Second World War, with the primary purpose of denying Antarctic waters, and especially the shelter afforded by abandoned whaling stations, to enemy warships.

However, in addition to military functions, a scientific programme including biology, geology and survey work was undertaken. With the end of the war in 1945, the British bases in Antarctica and the scientific work carried out from them were transferred to a new civilian organisation called the Falkland Islands Dependencies Survey, which operated under the auspices of the Colonial Office. The organisation was renamed the British Antarctic Survey in 1962. Since 1967 BAS has been a constituent institute of the Natural Environment Research Council.

2 The Archives Service

The Archives service was first established by BAS in 1979 following the centralization of the Survey's Headquarters in Cambridge three years earlier, and since 1988 its holdings have been housed in purpose built accommodation. Records created by BAS prior to 1967 have the legal status of public records as defined by the Public Records Act, 1958. BAS is recognised under this statute as an "Official Place of Deposit" for these records. This means that the facilities provided for storage and consultation meet the standards required by the Government's advisers on archival matters.

3 Holdings

The Archives service is concerned with the records produced internally by BAS and it predecessors, relating both to its scientific activities and to its administrative and logistical operations. Other than some private papers of former members of staff, the policy is not to acquire externally generated records concerning Antarctica, for which the Scott Polar Research Institute is the appropriate repository in the UK.

The Archive holdings can be summarised as follows:

- Administrative papers of head office, formerly based in Port Stanley, Falkland Islands, subsequently in London, and since 1976 at Cambridge.

- Internal reports on the maintenance and operation of British stations in Antarctica and the scientific work carried out from them.

- Field notes, maps, photographs, working papers and other material in a variety of media produced by BAS scientists involved in all areas of Antarctic research.

- Records of Operation Tabarin, 1943-45.

- Cine film, still photographs and personal reminiscences on audio tape produced by members or former members of staff.

4 Storage and Conservation

The Archives have two air conditioned rooms, where environmental conditions are constantly monitored. One room is used for storing papers documents, the other for magnetic tapes, discs and photographic materials. Both rooms are equipped with steel shelving on mobile bases, while the room for paper storage also has a number of large map chests.

Basic preventive conservation work is undertaken when records are accessioned. This takes the form of cleaning documents and putting them in acid free containers. If any workshop conservation is required, items are sent out to private contractors.

5 Finding Aids

All listing is now done on micro computers running MS-DOS. The software is called MODES (Museum Object Data Entry System), a system developed primarily for use in museums, but adapted successfully for archival description by Joanna Rae of BAS

Archives. This adaption, know as the Archives Format, takes account of the requirements set out in the *Manual of Archival Description* produced by Michael Cook and Margaret Proctor for the (British) Society of Archivists and allows for the flexible application of a hierarchical description. It has subsequently been adopted by a number of the other archive repositories in the UK.

From a single input of data MODES generates not only a list entry but also separate cards for the persons, places and subject indexes. Special reports ordering information in other ways, eg by location or by date of accession, can also be produced. User access to the data is currently through the hard-copy output, but a planned upgrade will soon allow for dealing with queries interactively.

In the longer term it is hoped that on-line access to the finding aids can be made available within the whole of BAS Headquarters, and that links can be made with other BAS databases. The means of doing this have yet to be decided.

A *Guide to Holdings* has been produced, but owing to the quantity of accessions in recent years it now requires updating. A number of Information Leaflets, summarizing holdings or indicating sources for particular subjects, are also available.

6 Use of the Archives

Use of the Archives is primarily by BAS personnel, but external enquiries are also catered for, subject to certain restrictions on records less than 30 years old. Currently about ten members of the public use the Archives each year.

7 Other Activities

The section also maintains the central filing registry for BAS Headquarters and provides intermediate storage for non-current records, many of which will not be retained permanently.

8 Staffing

The Archives service is provided by two Archivists and an Archives Assistant, with two further members of staff maintaining the Registry.

9 Further Reading

G.J. Smith and J. Rae. 1967. *BAS Archives - Guide to Holdings*. British Antarctic Survey, Natural Environment Research Council.

G.J. Smith and J. Rae. 1991. Modes (Archives) at the British Antarctic Survey Archives. *Journal of the Society of Archivists*, **12**(2), p. 95-108.

THE CONTRIBUTION OF SCAR TO ANTARCTIC RESEARCH

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Abstract

A brief history of the origins of the Scientific Committee for Antarctic Research (SCAR) and its remit is followed by an examination of the range of publications produced. The literature is divided into four groups - serials, symposia, reports or monographs, and others. The place of each in current Antarctic scientific information is examined. Inadequacies in the existing framework for public circulation of SCAR information are discussed. A list of SCAR publications is provided.

Introduction

The activities of the various Unions organised internationally under the umbrella of the International Council of Scientific Unions (ICSU) are all focused by discipline. The ICSU committees are largely interdisciplinary and no more so than the Scientific Committee on Antarctic Research (SCAR). This is uniquely different to the others in being the only one with a geographical remit - all science within the Antarctic area. Both this and its close relationship with the politics of the Antarctic Treaty make SCAR distinctive amongst the ICSU organisations.

It began life as the Special Committee on Antarctic Research in 1958, established to co-ordinate the Antarctic science undertaken during the International Geophysical Year (IGY). After the IGY its role changed to include all scientific disciplines. At the first meeting in The Hague the geographical area of interest was defined and has remained unchanged ever since. In 1961 its name was changed to Scientific Committee.

The SCAR Manual clearly defines the geographical area of interest - land within the Antarctic convergence - whilst the Southern Ocean islands lying outside this (Iles Amsterdam and St Paul, Iles Crozets, Prince Edward and Marion Islands, Iles Kerguelen, Tristan da Cuhna and Gough) were also listed as of interest. The manual defines the principal activities of SCAR as the "initiation, promotion and coordination of scientific activity in the Antarctic with a view to framing and reviewing scientific programmes of circumpolar scope and significance".

In pursuing these aims SCAR has established two principal types of international committees (called Working Groups and Groups Specialists), an annual international exchange of information on Antarctic programmes, sponsored meetings, and initiated publications. It is the published material that will be examined in this paper. However to understand how much of the material arises it is necessary to describe briefly the structure of SCAR.

Each full member of SCAR can appoint one delegate and one alternate delegate to attend the biennial delegates meeting as representative of their national committee. In addition five of the other ICSU Unions interested in SCAR activities send their own delegates. In between these plenary meetings SCAR business is overseen by an elected Executive Committee, headed by the President. Particular disciplines are catered for by Working Groups to which each member country can appoint one representative. In addition, to deal with specific subjects (especially inter-disciplinary ones) the Executive Committee can establish Groups of Specialists whose membership is based on expertise rather than on national representation. Fig 1 illustrates the present situation.

There are four principal types of published material - official records, handbooks and monographs, symposium proceedings and workshop proceedings. Since SCAR is not always the actual publisher of much of the material it is often very difficult to obtain all publications connected with SCAR. A significant amount is grey literature.

Categories of Publications

An absolute difference could be drawn between material actually published with registered serials or ISBNs and the remainder. In practical terms this is of little use and a more pragmatic classification will be used:

1. serials
2. symposia
3. reports or monographs
4. others

The difficulty with dealing with such a mixture of literature arising from multiple sources is its accessibility. I have included as an appendix a complete list of all SCAR publications with sources of supply where copies are still available. Queries with sources should always be directed to the Executive Secretary, SCAR, Scott Polar Research Institute, Lensfield Road, Cambridge CB2 1ER.

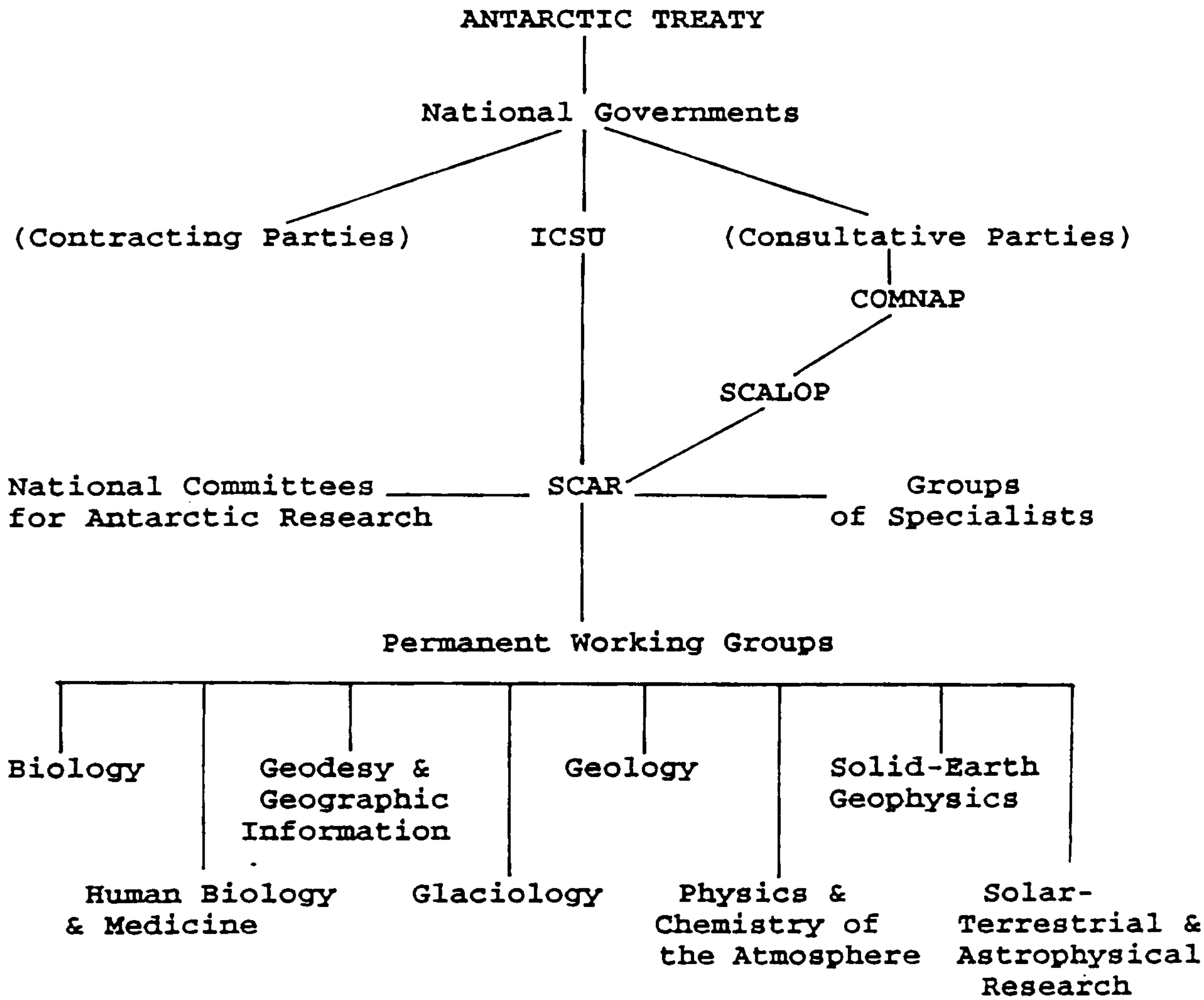

Figure 1

The relationships between the various national and international bodies involved in Antarctic research.
ICSU= International Council of Scientific Unions
COMNAP= Council of Managers of National Antarctic Programmes
SCALOP= Standing Committee on Antarctic Logistics and Operations

Serials

Annual National Reports

Each SCAR country has a national committee, normally adhering to the premier scientific academy in that country. It is the duty of this committee to produce an annual report of scientific activities previously conducted by all nationals and those planned for future seasons. It also incorporates a list, with addresses, of the principal scientists responsible for each discipline and a bibliography of all publications arising from the national programme. Multiple copies are circulated to all other SCAR National Committees. These are thus not SCAR publications per se but Reports to SCAR from national committees.

SCAR Bulletin

This is published quarterly by the SCAR Secretariat and included as part of the journal Polar Record. It is also distributed in separate covers. A Spanish translation is published by Instituto Antartico Argentino in Buenos Aires. At present it contains the official reports for all SCAR business meetings, summaries of Working Groups and Groups of Specialists meetings, relevant notes and articles as well as some material from Antarctic Treaty meetings, and constitutes the official record of policies and decisions.

SCAR Reports

Started in 1986 to complement the SCAR Bulletin, its purpose is to provide SCAR National Committees and others directly involved in Antarctic science with the full text of reports of Working Groups, and Groups of Specialists. In addition, it normally carries extensive summaries of relevant material from Antarctic Treaty meetings. So far eight reports have been published by the SCAR Secretariat.

BIOMASS Newsletter

Published irregularly to support coordination between the participants in this field of marine science (Biological Investigation of Marine Antarctic Systems and Stocks) it was produced by Prof. S.Z. El-Sayed, Dept. of Oceanography, Texas A&M University, College Station, TX, 77843-3146. The newsletter ran from 1979 to 1992 and constituted 26 parts in 13 volumes. Its distribution was limited but did extend to SCOR (Scientific Committee for Oceanographic Research), IABO (International Association of Biological Oceanographers) and ACMRR (FAO Advisory Committee on Marine Resources Research).

BIOTAS Newsletter

Published irregularly to support coordination between terrestrial scientists involved in the international programme (Biological Investigation of Terrestrial Antarctic Systems) it is produced by Drs. R.I. Lewis Smith and D.D. Wynn-Williams at the British Antarctic Survey, Madingley Road, Cambridge CB3 0ET. So far six issues have appeared since 1987. As well as a bibliography of relevant publications it contains a directory of relevant current research programmes and reports on related meetings and initiatives.

ANTOSTRAT Newsletter

Begun in 1991 this new newsletter aims to encourage activities and information flow within the community interested in seismic stratigraphical data in interpreting past environmental conditions, especially those relating to the evolution of Cenozoic palaeoenvironments. Published by Dr. A.K. Cooper, USGS, MS 999, 345 Middlefield Road, Menlo Park, CA, 94025, USA.

SCAR UAP Newsletter

In 1986 the Atmospheric Sciences Committee in SCAR established this irregular newsletter to promote communication between all atmospheric scientists active in the Antarctic. It is produced by Prof. H. Fukunishi, Upper Atmosphere and Space Research Laboratory, Tohoku University, Sendai 980, Japan. Four issues were published in 1986-88. In 1989 the publication was renamed "SCAR Newsletter - Atmospheric Sciences". Three issues were published during 1989-90. In late 1990 the name was changed again to reflect the division of science between two Working Groups and it is now called "SCAR Newsletter - Solar Terrestrial and Astrophysical Research - Physics and Chemistry of the Atmosphere".

Symposia

Early in the 1960s the SCAR Working Groups decided that one important way to improve information exchange would be to sponsor international disciplinary meetings with published proceedings. The routes taken to publication were various, utilising both special issues of established journals and books.

Whilst most SCAR Working Groups have organised symposia at some time only the geologists and biologists have persisted. There are now five volumes for geology and five for biology. In addition there are various symposia volumes on other subjects, e.g., human biology, Quaternary studies, meteorology, logistics, glaciology, and oceanography, etc. A full chronological list by discipline is in Appendix 1.

Reports and Monographs

The establishment of the BIOMASS programme in 1979 provided an new impetus for information exchange. The programme was only achievable by international collaboration at a level never previously attempted for marine biological studies. The necessity for gathering comparable data at different times from different ships required the use of standardised protocols. Thus was born the BIOMASS Scientific Series (10 numbered volumes and an oceanographic atlas), the BIOMASS Handbook Series (27 volumes) and the BIOMASS Reports (66 volumes). Of these the Scientific Series was meant to be widely available whilst the rest were distributed mainly within the BIOMASS community.

Certain topics have been dealt with by joint workshops or by commissioning experts in a particular field to produce a monograph. In this category come the conservation and environmental publications. In these SCAR has addressed the environmental implications of mineral exploitation, described the conservation areas of the Antarctic, and proposed a scheme for waste management.

In response to a request to provide an Antarctic framework for research in the International Geosphere-Biosphere Programme (IGBP) SCAR produced a discussion document in 1989 which will form the basis for its final contribution to IGBP.

SCAR became concerned that its voice was not readily accessible to many outside the Antarctic field. Although much of the work in the Antarctic was dealing with global problems the general scientific community had yet to see the relevance of Antarctic data to disciplinary studies in many fields. It therefore commissioned an experienced science writer to collect material from all of the SCAR committees and produce a single volume describing the work of SCAR in accessible prose. The resulting volume by Richard Fifield was published by Oxford University Press as "International research in the Antarctic".

Others

At irregular intervals SCAR publishes a revised version of the SCAR Manual which incorporates the Constitution, Procedures and Structure. The latest version available is dated 1987.

More recently SCAR has produced a package of leaflets which describe the functions of the various committees and the relationship of SCAR to the rest of the ICSU system.

Information Transfer

The only fixed point in SCAR's activities is the location of its office and the Executive Secretary. Housed in the Scott Polar Research Institute in Cambridge since it was formally established in 1970 it provides the international focus for the various committees and for the requests for advice and information from all over the world.

There is little doubt that the present system of circulating annual reports on the activities of each nation can make information readily available to those directly within the framework of SCAR. This should not be taken to mean all Antarctic scientists within each SCAR country but only those directly connected with the SCAR machinery via membership of SCAR international or national committees. Unfortunately, in some countries, the SCAR national committee is characterized by inertia and inactivity in terms of information flow. Many scientists with a direct interest in Antarctic science fail to see the SCAR Reports of other countries, and this is especially true in those countries that use responsive mode funding rather than institutionally directed research in Antarctic science.

If the Annual Reports to SCAR are not providing information as widely as they should what of other means? The SCAR Bulletin is more widely seen because it appears both in a regular journal taken by many libraries and individuals and as a separate circular. Thus the decisions reached by the Antarctic scientific community are relatively well publicised.

The newer newsletters appear to serve a valuable complementary function. They are only as good as the community they serve and rely for their success both on the quality of the editor and the enthusiasm of the scientists. In this respect the longest running- BIOMASS Newsletter - was an important vehicle in tying the activities of the nine BIOMASS countries together. An interesting feature of the BIOTAS Newsletter approach has been to supplement the information in the SCAR national reports with more detail on the programmes of the individual research workers to encourage collaboration.

The disciplinary focus in an Antarctic context of SCAR scientific meetings in the 1960s made these early symposia especially important both as a meeting place for colleagues and as a indicator of the range of studies brought to fruition in Antarctica. Whilst the early volumes tended to include all the papers presented at the meeting regardless of quality or subject, the present approach is to select only the best of the papers to form a volume with a clear theme. Much more vigorous reviewing and editing is also a hallmark of the recent volumes.

SCAR has never had to undertake any general bibliographic role since that has always been provided by the United States Cold Regions Bibliography Project at the Library of Congress. In Current Antarctic Literature, the printed Antarctic Bibliography and now the CD-ROM version, Antarctic scientists have a remarkably effective and complete bibliographic back-up. Present activities by the Scott Polar Research Institute to enter historical Antarctic material into their SPRILIB database will in due course effectively complement the more recent Library of Congress coverage.

The Future

SCAR has always suffered from chronic underfunding. Any comparisons between the costs borne by national operators in mounting their Antarctic operations and their contributions to SCAR as the coordinating international body are laughable. Even more remarkable are comparisons between the costs borne by host governments when organising a biennial meeting of the Antarctic Treaty and the national payments to SCAR.

With a budget of c.$250,000 and only two employees SCAR undertakes herculean tasks with surprisingly good results. The current trend is towards an increasing complexity and politicising of Antarctic science. This, together with the larger number of active nations demands much better information flow than before if the operators' resources are to be used wisely. SCAR needs to expand its permanent office to provide a centralised clearing post for information on data availability and publications, on current and proposed research programmes and, (in concert with the Council of Managers of Antarctic Programmes) on field activities. The establishment of an on-line bulletin containing the current national reports to SCAR, details of meetings and contact addresses for particular scientific activities would be a very useful step towards realising in full the remit it has been labouring towards over the part thirty years.

Acknowledgements

I am very grateful for the useful comments of Dr. P.D. Clarkson and Dr. R.M. Laws in preparing this paper.

APPENDIX 1

SCAR Publications
Reports and Symposia

Many of these publications are no longer in print. Please contact SCAR Office, Scott Polar Research Institute, Lensfield Road, Cambridge CB2 1ER, UK, for further information on price and availability.

Biology

Carrick, R., M. Holdgate, & J. Prévost, *editors*. 1964. *Biologie Antarctique/Antarctic Biology. Actualités Scient. Industr. No. 1312.* Hermann, Paris.

Holdgate, M.W., *editor*. 1970. *Antarctic Ecology*, 2 vols. Academic Press, London and New York.

Llano, G.A., *editor*. 1977. *Adaptations Within Antarctic Ecosystems*. Smithsonian Institution, Washington, DC.

Siegfried, W.R., P.R. Condy and R.M. Laws, *editors*. 1985. *Antarctic Nutrient Cycles and Food Webs*. Springer Verlag, Berlin.

Kerry, K.R. and G. Hempel, *editors*. 1990. *Antarctic Ecosystems: Ecological Change and Conservation.* Springer Verlag, Berlin.

Environment and Conservation

Holdgate, M.W. and J. Tinker, *editors*. 1979. *Oil and Other Minerals in the Antarctic: the Environmental Implications of Possible Mineral Exploration or Exploitation in Antarctica.* SCAR, Cambridge.

Zumberge, J.H., *editor*. 1979. *Possible Environmental Effects of Mineral Exploration and Exploitation in Antarctica*. SCAR, Cambridge.

Benninghoff, W.S. and W.N. Bonner. 1985. *Man's Impact on the Antarctic Environment*. SCAR, Cambridge.

Bonner, W.N. and R.I. Lewis Smith. 1985. *Conservation Areas in the Antarctic.* SCAR, Cambridge.

Rutford, R.H., *editor*. 1986. *Antarctic Environmental Implications of Possible Mineral Exploration and Exploitation*. SCAR, Cambridge.

Waste Disposal in the Antarctic. 1989. Australian Antarctic Division, Tasmania.

Geology

Adie, R.J., *editor*. 1964. *Antarctic Geology*. North Holland Publishing Co., Amsterdam.

Adie, R.J., *editor*. 1972. *Antarctic Geology and Geophysics*. Universitetsforlaget, Oslo.

Craddock, C., *editor*. 1982. *Antarctic Geoscience*. University of Wisconsin Press, Madison.

Oliver, R.L., P.R. James and J.B. Jago, *editors*. 1983. *Antarctic Earth Science*. Australian Academy of Science, Canberra.

Thomson, M.R.A., J.A. Crame and J.W. Thomson, *editors*. 1991. *Geological Evolution of Antarctica*. Cambridge University Press, Cambridge.

Hayes, D.E., *editor*. 1977. *Circum-Antarctic Marine Geology*. *Marine Geology*, **25**(1/3),

Glaciology

Colloque sur la Glaciologie Antarctique/Symposium on Antarctic Glaciology. 1961. *IASH Publications No. 55*. International Association of Scientific Hydrology, Gentbrugge, Belgium.

Gow, A.J., C. Keeler, C.C. Langway and W.F. Weeks, *editors*. 1970. *International Symposium on Antarctic Glaciological Exploration (ISAGE)*. *IASH Publication No. 86*. International Association of Scientific Hydrology, Gentbrugge, Belgium.

Proceedings of the Third International Symposium on Antarctic Glaciology. 1982. *Annals of Glaciology*, **3**.

Oceanography

Currie, R.I., *editor*. 1966. *Symposium on Antarctic Oceanography*.

Deacon, G., *editor*. 1971. *Symposium on Antarctic Ice and Water Masses.* SCAR, Cambridge.

Dunbar, M.J., *editor*. 1977. *Polar Oceans.* Arctic Institute of North America, Calgary.

Proceedings of the SCAR Symposium on the Ross Sea. 1981. *Journal of the Royal Society of New Zealand* **11**(4).

Meteorology

Antarctic Meteorology: Proceedings of the Symposium held in Melbourne February 1959. 1960. Pergamon Press, New York.

Polar Meteorology. 1967. *WMO Technical Note No.87.* World Meteorological Organisation, Geneva.

Orvig, S., *editor*. 1973. *Energy Fluxes Over Polar Surfaces. WMO Technical Note No. 129.* World Meteorological Organisation, Geneva.

Allison, I., *editor*. 1983. *Antarctic Climate Research: Proposals for the Implementation of a Programme of Antarctic Research Contributing to WCRP.* SCAR, Cambridge.

Logistics

Symposium on Antarctic Logistics. 1963. National Academy of Sciences, Washington, DC.

Sheffield, A.H., *editor*. 1972. *Antarctic Telecommunications.* SCAR, Cambridge.

Kohnen, H., A.J. Teixeira and A.N. Fowler, *editors*. 1991. *Proceedings of the Fourth Symposium on Antarctic Logistics and Operations.* Sao Paulo: SCALOP/COMNAP.

Others

van Zinderen Bakker, E.M., *editor*. 1969. *Palaeoecology of Africa and of the Surrounding Islands of Antarctica*, **5**. A.A. Balkema, Cape Town.

Edholm, O.G. and E.K.E. Gunderson, *editors*. 1973. *Polar Human Biology.* Heinemann Medical Books, London.

van Zinderen Bakker, E.M., *editor*. 1973. *Palaeoecology of Africa and the Surrounding Islands and Antarctica*, **8**. A.A. Balkema, Cape Town.

van Zinderen Bakker, E.M., *editor*. 1978. *Antarctic Glacial History and World Palaeoenvironments*. A.A. Balkema, Cape Town.

Fifield, R. 1987. *International Research in the Antarctic*. Oxford University Press, Oxford.

Rivolier, J., R. Goldsmith, D.J. Lugg and A.J.W. Taylor, *editors*. *Man in the Antarctic*. Taylor and Francis, London.

The Role of Antarctica in Global Change: Scientific Priorities for the International Geosphere-Biosphere Programme (IGBP). 1989. SCAR, Cambridge.

SCAR Manual. 1987. 3rd edition.

BIOMASS Publications

[For a listing of BIOMASS publications contact SCAR, Scott Polar Research Institute, Lensfield Road, Cambridge CB2 1ER.]

ENVIRONMENTAL MANAGEMENT IN ANTARCTICA: A GUIDE TO THE LITERATURE RESOURCES

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Abstract

The drafting of the Environmental Protocol to the Antarctic Treaty punctuated a growing body of scholarly research and official recommendation. This paper is intended to help the information professional identify and acquire information on environmental management in Antarctica. It is not comprehensive, but offers instead a selection of sources.

Introduction

The record of the Antarctic Treaty System (ATS) shows that the Antarctic environment and its protection have long been prime concerns of the Antarctic Treaty Consultative Parties (ATCPs). Although the basic document of the System, the 1959 Antarctic Treaty, mentions only briefly the "preservation and conservation of living resources in Antarctica" (Article IX.9(f)), from 1964 onwards various principles and practices of environmental management have been embodied in Recommendations, the Agreed Measures, three Conventions and, most recently, the Protocol on Environmental Protection. Concern for the Antarctic environment has not developed in a political vacuum but in a world increasingly aware of human effects on nature, a world informed by a vocal green movement and a developing discipline of environmental science. This paper introduces the topic environmental management in Antarctica by outlining the basic issues, briefly describing measures taken by the ATS to define and resolve the issues, and discussing some of the other sources of information.

Key Topics

The field of environmental management encompasses activities ranging from initial description of the environment in question to legislation and enforcement. The following key issues in the environmental management of Antarctica represent current topics of concern and research:

Conservation of species and ecosystems
- determination of stocks and sustainable yields
- protection of endangered species
- control of the introduction of species

Conservation of geographic features and scenery

Siting of research stations
- proliferation and concentration of stations
- cumulative environmental impacts

Waste management
- disposal of waste from stations, camps, ships
- engineering of disposal systems

Pollution
- airborne pollution from
  - vehicle and generator exhausts
  - incinerators
  - dust from construction sites and traffic
  - rubbish heaps and abandoned stations
- water pollution from
  - waste from stations and ships
  - plastic and other seaborne litter
  - oil spills at sea, on land and on ice
  - rupture of ship tanks in marine disasters, discharge from bilges
  - leaks from drums and land-based storage tanks

Tourism
- codes of conduct
- cumulative environmental impacts
- increased risk of pollution
- effects on wildlife and fragile ecosystems

Assessment, monitoring and prediction of impact
- EIA - environmental impact assessment
  - IEE - initial environmental evaluation
  - CEE - comprehensive environmental evaluation
- development of management plans and programmes
- environmental databases, including geographic information systems (GIS) and remote sensing

Contingency planning for environmental emergencies

Liability for environmental damage

Policy development

Enforcement through national and other legislation

Elucidation and promotion of "wilderness values"
- proposals for a World Park

Effect of global systems on Antarctic environment
- greenhouse effect and climate change
- ozone depletion
- sea level change
- transport of pollutants from other global sources (DDT, CFCs, PCBs)

Some of these issues have been apparent from the early days of the Antarctic Treaty while others have developed more recently. In the past three decades the world's perception of Antarctica has shifted. Once viewed as a vast icy waste, it is now seen as an essential yet vulnerable component in global systems.

Instruments Within The ATS For Environmental Management

The Antarctic Treaty came into force in 1961; additional instruments have been developed since then to accommodate the requirements of environmental management:

1959 Antarctic Treaty;
1964 Agreed Measures for the Conservation of Antarctic Fauna and Flora -- established rules of conduct to protect biota, initiated protected areas and permit system;
1972 Convention on Conservation of Antarctic Seals (CCAS) -- set catch limits, protected and other species, sealing zones, and seal reserves;
1980 Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR)-- noted for its ecosystem approach; extends beyond ATS limit of 60°S approximately to Antarctic Convergence;
1988 Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA)-- designed to deal in advance with environmental impact of any future mining activity (remains unsigned and unratified);
1991 Protocol on Environmental Protection to the Antarctic Treaty -- intended to deal comprehensively with all aspects (not yet in force).

An Antarctic Protected Area System which identifies, categorizes and defines the conditions of use of specific areas in Antarctica has been developed under the ATS. The following categories have been designated:

SPA Specially Protected Area -- where "unique natural ecological system" evokes outstanding scientific interest;
SSSI Site of Special Scientific Interest -- where significant scientific research may be jeopardized by interference;
HM Historic Monument -- a tomb, building or object of historic interest and deserving of preservation;

SRA Specially Reserved Area -- representing outstanding geological, glaciological, geomorphological, aesthetic, scenic or wilderness value;
MPA Multiple-use Planning Area -- to avoid risks of mutual interference or cumulative environmental impacts by coordinating human activities;
ASTI Area of Special Tourist Interest -- to identify sites of scenic or other interest while diverting tour groups from inappropriate or protected areas.

In Annex V to the new Protocol these categories are rationalized into three:

ASPA Antarctic Specially Protected Area -- incorporating former SPAs and SSSIs (to be renumbered and renamed);
ASMA Antarctic Specially Managed Area -- incorporating former MPA and ASTI categories;
HSM Historic Sites and Monuments.

Areas may be proposed for designation as ASPA or ASMA by submission of a proposed Management Plan to the Antarctic Treaty Consultative Meeting.

Mechanisms For Enforcing ATS Provisions

Decisions are made by consensus within the ATS, which then has no direct means of enforcement "except in that ATCPs may enact and enforce national legislation to ensure their citizens comply with the spirit of the recommendations made" (Harris, 1991:314). Thus, in addition to publication in the reports of the Antarctic Treaty meetings, these decisions appear in official documents addressed to the governments involved (such as parliamentary papers in Great Britain or congressional reports in the US) and in the form of national or domestic legislation.

Although the Protocol provides for exchange of information on relevant domestic legislation, it was recommended at the XVIth ATCM that these exchanges include "information on any domestic legislation enacted to give effect to the Antarctic Treaty and to obligations arising from Recommendations adopted by [ATCMs]" (Rec. XVI-1). Tracking this legislation through public sources requires an intimate knowledge of the government documents of the ATCPs. Fortunately, this formidable task has already been undertaken by W.M. Bush in his *Antarctica and International Law; a Collection of Inter-state and National Documents*, published in three volumes plus an index (1982, 1988) and updated in loose-leaf format (1991-). Under this title Bush brings together source documents from the Treaty meetings and pertinent excerpts from the resulting legislation.

Key Players And Useful Publications

The Antarctic Treaty System

Since its beginning with the 1959 Treaty, the Antarctic Treaty System has grown to include nearly two hundred Recommendations, which are the decisions reached as the official Antarctic Treaty Consultative Meetings (ATCMs), and the Conventions listed above, which are negotiated at Special Consultative Meetings (ATSCMs). Reports of these meetings are distributed to a network of official ATS contact points. Decisions from the meetings also appear, in part, in the publications of the Scientific Committee on Antarctic Research (SCAR) such as *SCAR Bulletin* and *SCAR Report.*

The most convenient source for finding ATS decisions on environmental management is the latest edition of the *Handbook of the Antarctic Treaty System* (Heap, 1990), a compendium of material including texts of instruments, extracts from reports, Recommendations and interpretative scope notes. The seventh edition covers 1959 to 1989, and includes material from the XVth ATCM in Paris. A Spanish version, *Manual de Teoria y Practica del Sistema Antartico*, based on Heap's *Handbook*, was jointly produced by the Antarctic research institutions of Argentina, Chile and Uruguay in 1991. The detailed description of the *Handbook* that follows is warranted by its great usefulness in bringing together so much primary information.

The *Handbook* comprises four parts. In terms of environmental management, *Part 1, General Measures*, is of interest only because it includes the text of the 1959 Antarctic Treaty. *Parts 2, 3* and *4* focus particularly upon the subject.

Part 2, The Antarctic Environment, assembles all the material (with one exception) appropriate for consideration by the ATCPs in devising the new Protocol on Environmental Protection. This part reprints extracts of Recommendations and ATCM reports, recapping many of the key issues of environmental management in Antarctica. Approximately three-quarters of all Recommendations concern conservation measures.

The crucial topic omitted from *Part 2* appears in *Part 3, The Antarctic Protected Area System*, which assembles the Recommendations responsible for the establishment of protected areas. Included here are descriptions of 20 SPAs (of which 16 have retained that status), 32 SSSIs and 55 Historic Monuments.

Part 4, Other Components, includes texts and related material concerning the three conventions listed above: 1972 CCAS, 1980 CCAMLR, and 1988 CRAMRA. This last convention has been overtaken by the Protocol and remains unratified.

At the XVth Antarctic Treaty Consultative Meeting in Paris (1989) the ATCPs recommended the "elaboration of a comprehensive system for the protection of the Antarctic environment" (Rec. XV-1.1). This elaboration led to creation of the Protocol on

Environmental Protection to the Antarctic Treaty, which was negotiated in the four-session XIth ATSCM and signed in Madrid on 4 October 1991.

Protocol on Environmental Protection

The Protocol is structured as a supplement to the Antarctic Treaty and represents a determined attempt to provide "comprehensive protection of the Antarctic environment and dependent and associated ecosystems and [designates] Antarctica as a natural reserve, devoted to peace and science" (Art.2). It comprises 27 articles and five annexes; its structure allows for adaptation to change by the addition or modification of annexes as new environmental concerns arise.

The annexes are: I Environmental impact assessment, II Conservation of Antarctic fauna and flora, III Waste disposal and waste management, IV Prevention of marine pollution, and V Area protection and management. The fifth annex was added at the XVIth ATCM in Bonn, immediately following the conclusion of the XIth ATSCM. A possible sixth annex, on tourism, is under discussion.

The Protocol has received extensive publicity on account of Article 7, which simply states: "Any activity relating to mineral resources, other than scientific research, shall be prohibited". The Protocol is open to review after fifty years. Until then it provides for modification or amendment, specifying, however, that Article 7 may not be amended unless a minerals regime (such as CRAMRA) is in place.

Commission for the Conservation of Antarctic Living Marine Resources

The acronym CCAMLR is used for both the Commission and the 1980 Convention by which the Commission was authorized. As CCAMLR's brief is the management of Antarctic marine living resources, by definition its publications are relevant to any study of environmental management and the Southern Ocean. The 1991 booklet *Conserving Antarctic Marine Life; CCAMLR ...Its Origins, Objectives, Functions and Operation* provides a useful guide to the Commission's activities and its publication. These include report series (of the Commission and of the Scientific Committee), a biannual newsletter and two handbooks, *Standard Methods for Monitoring Parameters for Species* (CCAMLR, 1988) and *FAO Species Identification Sheets for Fisheries Purposes* (Fischer and Hureau, 1985).

The Scientific Committee on Antarctic Research

SCAR, a body of the International Council of Scientific Unions (ICSU), is not formally affiliated to the ATS. Nevertheless, SCAR maintains close associations, and one of its primary objectives is "to provide expert advice on scientific, environmental and conservation matters to the ATS" (XVI ATCM: 231). SCAR may be viewed as the non-governmental organization (NGO) with the greatest experience and involvement in the Antarctic and its environment.

Relevant SCAR publications include *Conservation Areas in the Antarctic* (Bonner and Smith, 1985), *Man's Impact on the Antarctic Environment* (Benninghoff and Bonner, 1985), and *Waste Disposal in the Antarctic* (SCAR, 1989).

In response to ATCM Recommendation VIII-10 (1975) SCAR organized a comprehensive international research program on Biological Investigations of Marine Antarctic Systems and Stocks (BIOMASS) which has resulted in numerous articles, reports and handbooks as well as the creation of the BIOMASS Data Centre. The BIOMASS Programme has also been an important source of advice for CCAMLR (XVI ATCM: 235).

Recently SCAR formed the Group of Specialists on Environmental Affairs and Conservation (GOSEAC) to provide a forum for regular consideration of environmental issues and to develop policies and responses that could be recommended for implementation by the ATCPs. GOSEAC considers such matters as protected areas and their management, impact assessment, monitoring programs, data management, tourism, collaboration with non-SCAR bodies, abandoned stations and historic sites, and SCAR's role in conservation.

Council of Managers of National Antarctic Programs

Formed in 1988, COMNAP and its subgroup SCALOP (Standing Committee on Antarctic Logistics and Operations) are affiliated with SCAR. COMNAP's environmental concerns include waste management, marine pollution, alternative energy, tourism, environmental assessments and siting of stations. SCALOP conducted the Fourth Symposium on Antarctic Logistics and Operations, the proceedings of which begin with a section on environmental management (Kohnen et al, 1990). In a workshop in June 1991 COMNAP established an Antarctic Environmental Assessment subgroup and formulated and adopted "The Antarctic Environmental Assessment Process: Practical Guidelines", the text of which is reproduced in the *Final Report of the Sixteenth Antarctic Treaty Consultative Meeting* (ATPs 1992: 271-283).

Environmentalists and Other Non-Governmental Organizations

The negotiation and adoption of the Protocol on Environmental Protection were taken as a great triumph by the environmental activist groups, the green NGOs, who had vigorously campaigned to overturn the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA). Despite CRAMRA's focus on protecting the environment in the event of mining, the green view rejected the allowance of any minerals exploitation and sought instead to preserve Antarctica as a World Park. The world park notion was proposed in 1972 at the Second World Conference on National Parks. At that time the concept was not defined, but it was understood to connote protection of wilderness values (Keage 1986: 66; Barnes 1991: 186). Since then the concept has been gradually developed by NGOs around the world until, at the XIth ATSCM in 1990, the Antarctic and Southern Ocean Coalition (ASOC) was able to submit a 90-page proposal entitled "The Convention on Antarctic Conservation" (ASOC, 1990).

Formed in 1977 as an umbrella for the Antarctic campaigns of other NGOs, ASOC showed up at ATCMs and preparatory meetings throughout the 1980s, distributing unsolicited information papers to the ATCPs and producing news releases for the public. In addition to the *Information Paper* series, ASOC has produced a newsletter, *ECO*, since 1978. Recently the organization has achieved some measure of acceptance by the ATCPs and, along with other international organizations, contributes expert advice to the ATCM. ASOC members include Friends of the Earth International (FOEI), Greenpeace International, World Wide Fund for Nature (WWF), and The Antarctica Project, each of which also publishes on Antarctic conservation. Some members, such as WWF and Greenpeace also fund research on Antarctic environmental management.

Greenpeace operates the research vessel *Gondwana* and, until a recent decision to redirect resources, the World Park base. The organization has set an example for other operations by publishing an IEE: *Initial Environmental Evaluation: Removal of World Park Base, Cape Evans, Ross Island, Antarctica 1991/92* (Greenpeace, 1991). Greenpeace expedition reports include commentary on environmental management (and mismanagement) observed during "inspection" tours of other stations. *The Greenpeace Book of Antarctica* (May 1988) has become a well known green guide to the region.

Some NGOs concerned with Antarctica have proved ephemeral; others are more robust and have produced useful publications. These latter organizations include the Environmental Defense Fund, IUCN - The World Conservation Union (formerly the International Union for the Conservation of Nature), and IIED, the International Institute for Environment and Development, which is now merged with the World Resources Institute (WRI).

Writing for the Environmental Defense Fund, Bruce Manheim reviews the environmental record of the NSF in his book *On Thin Ice; the Failure of the National Science Foundation to Protect Antarctica* (1988) and again examines US policy in *Paradise Lost? The need for Environmental Regulation of Tourism in Antarctica* (1990).

IUCN has long been involved in Antarctica, contributing to the preparation of CCAMLR and enjoying a close working relationship with SCAR. *A Strategy for Antarctic Conservation* (IUCN, 1991) is IUCN's comprehensive review of the Antarctic environment, conservation issues and how to implement a plan of action.

A series of IIED reports authored by Lee Kimball has punctuated the progress of environmental deliberations of the ATS since 1987 and Kimball contributes frequently to conference proceedings. In 1991 WRI published *Blueprint for Antarctica*, which is the report of a jointly sponsored workshop intended to "consider key challenges facing Antarctic policy-makers through the end of the century".

Other Sources of Information

Growing environmental awareness and increasing scientific activity in the Antarctic have led to a greater number of conferences held each year to discuss management of the Antarctic and of its environment. These often result in either a proceedings volume or a special issue of a journal. A sampling of these publications is included in the references to this paper.

National Antarctic research organizations publish material on environmental management in reports and occasional publications as well as in house organs such as *New Zealand Antarctic Record, South African Journal of Antarctic Research*, Australia's *Aurora* and *ANARE News*, and NSF's *Antarctic Journal of the United States*. Relevant articles appear in the popular press in sources as diverse as *New Scientist* and *TV Times*. Refereed research papers on Antarctic environmental management will be found in a variety of academic journals, but appear most frequently in polar-oriented titles such as *Polar Biology, Antarctic Science* and *Polar Record*.

Bibliographic access to information on Antarctic environmental management is afforded through the CD-ROM *Arctic and Antarctic Regions* and the print versions of two of its databases: *Current Antarctic Literature*, cumulated in *Antarctic Bibliography*, and published by the Library of Congress; and *Polar and Glaciological Abstracts* compiled by the library of the Scott Polar Research Institute.

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- ABSTRACT -

THE INTERNATIONAL ANTARCTIC CENTRE IN NEW ZEALAND: A COOPERATIVE APPROACH TO INFORMATION SHARING

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The International Antarctic Centre in Christchurch, New Zealand, focuses on the provision and application of information concerning antarctic science and environment to researchers and policy makers concerned with Antarctica and global change. At the present, the Centre houses the staging operations of the U.S. and New Zealand Antarctic Programs. More countries are exploring locating their staging operations there also, and joining their scientists to an international staff who would be concerned with developing a scientific information system. In addition, an antarctic environmental database, would be developed and used to assist Antarctic Consultative nations carry our environmental impact analyses and manage facilities at their stations.

The Centre's international activities will be supported by an International Environmental Information System. One aspect of this system will be a bibliographic database of antarctic scientific literature, modeled on the *Arctic Data Interactive* for north polar regions. A second component is a Geographic Information System that permits researchers to correlate antarctic data in a spatial format. Third will be the databases that can be used to manage operations at antarctic stations and analyze the environmental impacts of operations and construction activities. Fourth will be the policy and linkage protocols to connect the Center with other global networks, such as the International Geosphere-Biosphere Program (IGBP) Regional Research Networks, the Conservation Monitoring Centre, and the Global Resources Information Database (GRID) nodes.

The International Antarctic Centre is presently adding a visitors' centre, where the scientific results from Antarctica can be displayed to the public for educational an entertainment purposes. The combined assets of the International Antarctic Centre - including an international environmental system, national antarctic programs of several nations, and a public visitor centre - will bring for the first time information about Antarctica to the global fore.

NSF'S ROLE IN POLAR INFORMATION

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Abstract

As manager of the U.S. Antarctic Program, since 1960 the National Science Foundation (NSF) has served as clearinghouse and source of antarctic information in governmental and nongovernmental organizations. In 1978 the Antarctic Conservation Act added information and education assignments. NSF's arctic information assignment began in 1968 with its tasking to chair the Interagency Arctic Research Coordinating Committee; that committee was abolished in 1978. After 1984 NSF was assigned to head the Interagency Arctic Research Policy Committee, which also has information tasks. To help meet these assignments the Foundation publishes two journals and additional special reports devoted to arctic and antarctic research; supports translations, a monograph series, and bibliographies; and produces publications and audio-visual products to meet needs of specialists and the broader public. Each year it handles approximately 4,000 inquiries about polar regions. It awards grants and contracts to U.S. institutions for projects to develop or improve polar information.

Background

The National Science Foundation (NSF) is the U.S. Government agency that promotes basic research and education in science and engineering. Most of its annual budget of about $2-billion, provided by American taxpayers as appropriated by the Congress, is awarded as grants to scientists at universities for research, education, and related activities in most fields of science, mathematics, and engineering. About 16,000 of the 38,000 or so proposals received each year result in grants. NSF has financially supported virtually all U.S. antarctic research since 1957. Fiscal-1991 funding for this research and its operational support totaled $175-million; the program that year (a typical one) included approximately 110 field research projects, composed mainly of university-based investigators. Additional research is supported at home institutions. Other Federal agencies field research projects within the NSF antarctic logistics framework, but *White House Memorandum 6646* (5 February 1982) tasks NSF to "budget for and manage the entire United States national program in Antarctica, including logistics support activities, so that the program can be managed as a single package." U.S. Government support for arctic research is different; it is spread over 12 agencies. Also unlike the Antarctic, significant additional arctic research is performed or supported by industry and by state and local governments. Fiscal-1991 Federal support for arctic research totaled about $127-million. Of that, NSF provided over $27-million involving 229 awards to 98 institutions in 38 states and the District of Columbia. Because of the Government's decentralized support of arctic research, the Arctic Research and Policy Act of 1984 establishes two coordinating bodies: The Arctic Research Commission is an independent agency with oversight responsibilities; the Interagency Arctic Research Policy Committee comprises agencies with arctic interests and is chaired by NSF. Because NSF has different overall responsibilities for the two polar regions, it also has different information assignments for the two polar regions.

The Antarctic Information Assignment

Activities in Antarctica take place under the guidance of the 1961 Antarctic Treaty, to which the United States is a signatory. The treaty is a living document, continually being added to, but it is based on four powerful features: the use of force is prohibited, activities may not be used to assert or deny views on such issues as territorial claims, designated observers may inspect any facility, and information is to be made freely available. (Most agree that freely available information does not have to be available free.) Specifically, the treaty says "information regarding plans for scientific programs in Antarctica shall be exchanged to permit maximum economy and efficiency of operations . . . scientific observations and results from Antarctica shall be exchanged and made freely available." NSF received its antarctic information assignment on 3 August 1960, when the Government's Bureau of the Budget said in *Circular A-51* ("Planning and conduct of the United States program for Antarctica"): "While no central depository for antarctic records is required, the National Science Foundation shall serve as the clearinghouse and source of information regarding the existence and location of antarctic records, files, documents, and maps maintained within the various executive agencies and nongovernmental organizations." When the bureau's successor, the Office of Management and Budget, revised the circular on 4 August 1971, it deleted the nine words preceding the first comma. NSF has continued to exercise the information function, although *Circular A-51* ceased being a formal document when the White House issued *Memorandum 6646* in 1982. Public Law 95-541, the Antarctic Conservation Act of 1978 (Regulations, Section 670.52 g & h), gives NSF the task to "provide educational and other information regarding the Antarctic." The 1982 White House memo says: "The United States Antarctic Program shall be maintained at a level providing an active and influential presence in Antarctica designed to support the range of U.S. antarctic interests." NSF infers an information responsibility from the "active and influential" phrase, reasoning that disseminating information about activities conveys influence and thus supports U.S. interests.

Finally NSF encourages dissemination of information about its polar programs because of the relatively large cost to collect the information and its value to scientists and the public.

The Arctic Information Assignment

In 1968 NSF was tasked to start an Arctic Research Program. It also was asked to chair an Interagency Arctic Research Coordinating Committee (IARCC) that would write annual reports of Federal unclassified research, promote cooperative use of logistics, survey foreign research, identify the scope and cost of scientific problems, encourage international field work, data exchange, and research analyses, and coordinate research in the two polar areas. The committee was designated a "control point for communication between government agencies and universities". In March 1972 the Interagency Arctic Policy Group, chaired by the Department of State, tasked NSF to accelerate the exchange of information on current activities and future plans, survey the research of all nations in the Arctic, prepare a periodic report to inform other nations of U.S. activities, arrange for a common data base for providing information, and accelerate translation of foreign polar literature into English.

On 30 June 1978 the Federal Coordinating Council on Science, Engineering, and Technology dissolved the IARCC. In a letter to NSF, it said: "We hope that you will take the lead in assessing the future need for additional coordination". The Arctic Research and Policy Act of 1984, whose goal is "to provide for a comprehensive national policy dealing with national research needs and objectives in the Arctic", established an Interagency Arctic Research Policy Committee and directed NSF to chair it. The committee is required to "promote Federal interagency coordination of all arctic research activities including ... the sharing of data and information associated with arctic research".

Polar Information Activities of the NSF

To help meet these assignments NSF has developed information products that are produced in house, in cooperation with other Federal agencies, and through award of funds to other performers by means of grants, contracts, and interagency agreements. This summary covers some major activities.

Journals

NSF published issues 1-60 of the *Antarctic Status Report*, 1959-1963, to report on field investigations in the U.S. Antarctic Research Program. Issues 61-84 appeared in 1964-1965 as the *Antarctic Report*. In 1966 the Navy's *Bulletin of the U.S. Antarctic Projects Officer*, which had reported field operations since 1959, merged with the *Antarctic Report* to form the new NSF publication, *Antarctic Journal of the United States*. The *Journal* was published bimonthly through 1975, quarterly in 1976. In 1977 is took its present format of quarterly issues and a large annual review issue. NSF published 15 issues of the *Arctic Bulletin* in the years 1973-1978. The *Bulletin* reported mainly on research activities of the 12 member agencies of the Interagency Arctic Research Coordinating Committee, but also gave attention to international investigations. Its career ended when the IARCC was abolished.

In 1987 NSF began *Arctic Research of the United States* on behalf of the Interagency Arctic Research Policy Committee and in cooperation with the Arctic Research Commission. That publication continues at the rate of two issues per year. Other information products. NSF has issued a large number of documents related to its administration of research programs in the polar regions and to its interagency, and the Nation's international, responsibilities. Some publications, such as the *U.S. Antarctic Program Personnel Manual* and *Survival in Antarctica*, are intended mainly for program participants, but have found outside audiences. NSF handles much of the Nation's international antarctic information obligations. The NSF annually publishes *United States Antarctic Activities*, required by the Antarctic Treaty, and it contributes funds and information for the annual *United States Antarctic Research Report to the Scientific Committee on Antarctic Research*, published by the National Academy of Sciences. NSF publishes biennial reports to the Congress describing actions of the interagency arctic committee and periodically updates the Government's 5-year arctic research plan. Annually, it issues *Arctic Science, Engineering, and Education Directory of Awards*, a document that describes each arctic grant made by the Foundation. NSF grants to the American Geographical Society resulted in the 19-volume *Antarctic Map Folio Series*, 1963-1975. Grants to the American Geophysical Union since 1962 have provided partial support to the *Antarctic Research Series*, which publishes topical volumes and original research papers too long or data-rich for the standard scientific journals; some 50 volumes have been published. NSF sees to occasional issuances of the *Gazetteer of the Antarctic* in cooperation with the Geological Survey and the Defense Mapping Agency. The world's premier topographic and geologic maps of Antarctica have resulted from substantial NSF awards over the last 30 years to the Geological Survey. The American Geographical Society in 1975 published the definitive 1:5,000,000-scale topographic map of the Arctic with NSF support. An archive of antarctic audio-visual products, particularly slides but including photographs, video footage, and films, is maintained by an NSF contractor. The public may obtain duplicates. NSF has turned over many of its official polar files to the National Archives at its downtown Washington, D.C., headquarters building for long-term public access and safekeeping.

Translations

NSF supported translation into English, and publication, of issues 1-90 (1959-1975) of the *Soviet Antarctic Expedition Information Bulletin* through grants to the American Geophysical Union, then in 1977 helped Scripta Publishing (later V.H. Winston and Sons, Inc.) start *Polar Geography* (now *Polar Geography and Geology*), which selects, translates, and publishes Russian journal articles. Using excess foreign currency held by the United States, NSF supported translation into English and publication of more than 50 volumes of Russian-language polar research literature, still available in microform from the National Technical Information Service. This excess-currency program is not now active.

Bibliographies

On 17 January 1963 NSF selected the Library of Congress from amongst four offerors to begin the *Antarctic Bibliography*. The Library's Cold Regions Bibliography Project, active ever since, locates, microfilms, abstracts, and indexes all the world's serious antarctic literature published since 1951, where a single-volume Navy bibliography leaves off. At the end of 1991, 49,835 titles had been cited. Principal print products are *Antarctic Bibliography* bound volumes and the monthly *Current Antarctic Literature*. NSF's financial support for the project, continuous since 1963, was $238,238 in fiscal 1992. The file can be searched online using Orbit's COLD database. *The Arctic and Antarctic Regions CD-ROM* containing it and other files is available from NISC, Baltimore, Maryland.

On 5 July 1991 NSF and the Army's Cold Regions Research and Engineering Laboratory, which funds the Cold Regions Bibliography Project's *Bibliography on Cold Regions Science and Technology*, delivered an Information Systems Plan to the Library to modernize hardware and software for the project--the first general upgrade since the late 1960s. The two agencies each provided $50,000, and on 26 May 1992 the Library issued Request for Proposals 92-38, "Cold Regions Bibliography Project Software." Proposals were due on 13 July, and a contract is to be awarded in August. The upgrade will move the file from the Library's mainframe to a Sun work station, will for the first time perform input, search, and edit operations online, and later will enable searching and input over electronic mail networks. The goal is to increase coverage and accessibility without increasing staff, the project's costliest component. Over its 42-year life the project has achieved continual productivity gains; the upgrade is an attempt to continue or accelerate that trend. NSF and other U.S. and Canadian agencies joined the U.S. Department of Defense in funding the Arctic Institute of North America's *Arctic Bibliography* from volume 10 (1961) until the project ended with the publication of volume 16 in 1975. In 1974 NSF and the National Research Council of Canada co-chaired a multiagency group to evaluate the feasibility of continuing the joint support of an arctic bibliographic service. An NSF-supported study by the Franklin Institute Research Laboratories "concluded that the *Arctic Bibliography* cannot be effectively replaced by commercial on-line bibliographic services." Sadly, the *Arctic Bibliography* project ended anyway, owing to tight funds at the agencies and difficulties automating the project. But the Franklin study provided a rationale for regional bibliographies and contributed to NSF's decision during hard times to continue to fund the *Antarctic Bibliography* project at the Library of Congress. Using the *Antarctic Bibliography* data base and its own *Science Citation Index*, the Institute for Scientific Information in 1980 performed an NSF-funded ($28,956) citation analysis of antarctic research that quantified the value of antarctic research and pointed to the potential of bibliometrics. Co-citation cluster analysis of "research fronts" showed that "a number of highly cited antarctic articles were among the core documents defining intellectual change" in some of the most active areas of scientific research in the 1970s. The study showed that antarctic research, particularly biology, is cited less than other research. But "the results are quite different for NSF-supported antarctic research, which is cited more often than the comparison group, particularly in the biological sciences." Of interest to librarians on a budget, the study showed that just six journals earned more than half the 28,974 citations made to antarctic literature during the period evaluated (1961-1978).

Data and Networks

NSF is keenly aware of science's need for integrated data and the ability to move it about a research community. While the large, discipline-oriented data sets tend to be supported by other agencies, particularly NASA and NOAA, NSF has supported specific data and networking studies for polar regions. Here are examples. A workshop recommended ways to improve access to U.S.-held antarctic meteorological data (NSF grant DPP 87-17108, $18,630, University of Colorado). Patricia McMillan, Arctic Environmental Information and Data Center, University of Alaska, used videotape to transfer science-related information to rural Alaska villages of the North Slope Borough; the project developed recommendations for use of video in future arctic research documentation (DPP 88-15057, $50,389). Paul H. McCarthy and Martha Andrews increased access to polar-based bibliographical information through the use of CD-ROM technology (DPP 89-13041, $154,929, University of Alaska). Kenneth C. Jezek and Lynn Lay received support for the 14th Polar Libraries Colloquy (DPP 91-20382, $53,762, Ohio State University). NSF is installing a computer-based information system at McMurdo Station's new Albert P. Crary Science and Engineering Center. Christchurch International Airport Ltd. has built an antarctic support facility in New Zealand that contains an International Center for Antarctic Information Resources. NSF, which leases space in the facility for its advance headquarters and staging, has access to the information center and a library operated by the New Zealand Antarctic Program.

Public Information

The Polar Information Program in NSF's Division of Polar Programs receives about 4,000 inquiries per year regarding arctic and antarctic regions; most requests are handled over the phone or by mailing out publications or handouts developed for this use. NSF provides U.S.-based antarctic tourism companies with videotapes and quantities of brochures describing the U.S. Antarctic Program and conservation requirements for use in promoting understanding, among their passengers, of Antarctica's value and environmental sensitivity. Representatives of the media annually are invited to visit U.S. research installations in Antarctica and Greenland for the purpose of producing information for the public; a larger than usual example was NSF's operational support in 1990 of production of the film *Antarctica*, now playing at special IMAX and OMNIMAX theaters around the world. The Museum of Science and Technology, Chicago, reimbursed NSF for logistics provided for the $4-million-plus project, which was funded from sources other than the U.S. Government. The Polar Information Program manages an Antarctic Artists and Writers Program to provide humanities scholars access to antarctic sites. NSF's education directorate supports production of educational materials on polar regions. A current example is the traveling exhibition "Antarctica and the global future" (NSF grant MDR 89- 55361, $563,723, Science Museum of Minnesota). With additional support from the Hitachi Foundation, the Minnesota museum produced and is distributing copies of an interactive videodisc for educational use in middle schools.

Conclusion

NSF performs and funds a range of information products and services intended to complement and maximize its support of polar research. Some of these services, such as the *Antarctic Bibliography*, have strong community support and seem subject more to gradual or intermittent improvement rather than radical change or termination. Others respond to shorter-term needs and may yield to higher priorities in the years ahead. NSF welcomes comments from users (current and potential) and carefully reviews suggestions for change or improvement in its polar information activities.

INFORMATION-SEEKING BEHAVIOR OF SCIENTISTS AND GRADUATE STUDENTS AT THE INSTITUTE OF ARCTIC AND ALPINE RESEARCH

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Abstract

Geology and geography graduate students, research associates, and faculty at the Institute of Arctic and Alpine Research (INSTAAR), University of Colorado, were studied to determine how their information needs are being met. INSTAAR's focus requires a multi-subject approach to cold regions studies, thus differing from the standard disciplinary approach. An analysis of information sources used through professional contacts, at libraries and information centers, and in the home and office, showed traditional sources such as talking with colleagues, using references at the end of articles, and use of personal collections, still to be the main information sources. Electronic access tools such as e-mail, FAX, online catalogs, and CD-ROMs are, however, definitely making headway. A perceived trend away from nearly exclusive use (among students) of the INSTAAR library collection appears to be a result of the proliferation of scientific publication. Students now find it necessary to use as many as a dozen libraries. Faculty and research associates, on the other hand, rely heavily on their extensive reprint collections. Methods of access to needed references differs among the groups, with faculty extending their traditional "word of mouth" approach through electronic mail, and students being somewhat more likely to avail themselves of electronic access to computerized databases and catalogs. Recommendations are made for dealing with the main barriers to the acquisition of information, identified as 1) lack of time by the user, and 2) inadequate library holdings.

Introduction

There is a perception among some special librarians that university students are making less use of special library resources at a time when the amount of information is proliferating. The end-user has the potential to access vastly increased amounts of information but is possibly using less, especially older, material. Reasons for this possible phenomenon have been noted as follows:

1. The user perceives that online access is total access.
2. The level of success the user has experienced in the way of document access and delivery has been unsatisfactory.
3. The user is not familiar with effective access tools.
4. The user is overwhelmed by the amount of information available.

The following quote emphasizes the above concerns. "Government agencies, scientific societies, the private sector, and academic institutions have been devoting enormous sums of money to gathering, processing, and disseminating scientific and technical information. New technologies have revolutionized storage and retrieval options, opportunities, and costs. New information systems have been designed on the assumption that we know how scientists seek information and how they would like to access it. But this many not be the case. One can argue that not enough attention has been paid to the opinions, problems, and needs of the user of scientific information" (Bichteler and Ward, 1988a, p. 25).

Several recent studies of information seeking behavior in academia deal with university faculty in the broad sense (D'Elia and Hutkins, 1986) or with faculty in humanities (Broadbent, 1986; White, 1975; Wiberley and Jones, 1989). According to Bichteler and Ward (1989, p. 169) and Pelzer and Leysen (1988, p. 328), scientists, engineers, and the human medical community have been well documented concerning information seeking behavior. The work of Bichteler and Ward (1988a; 1988b; 1989) is important to the present study because it includes information on academic geologists as well as geological scientists employed outside of academia.

Regarding the information seeking behavior of graduate students in the field sciences, Glen makes the following observation: "The last 20 years have witnessed an increase of about 600% in the total number of published pages in science; very rapidly growing fields such as geophysics are even more daunting. The graduate student of 1990 is tackling a literature that a professor could not have dreamed of 20 years ago" (Glen, 1990, p. 362). The work of Pelzer and Leysen (1988) dealing with veterinary science students served as an analytical model for the present study, although the results were very different.[1]

The objective of this study, therefore, is to evaluate "the opinion, problems and needs" of a definable set of information users, the scientists and graduate students at the Institute of Arctic and Alpine Research (INSTAAR), University of Colorado at Boulder, with a view to improving access and delivery of information to researchers. Different approaches to information seeking by faculty and research associates on the one hand, and graduate students on the other, are analyzed, particularly in terms of the effect of computer-based technologies.

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[1] Most of the references discussed here were found, along with several others that were not useful, by searching several Dialog databases: Library and Information Science, Information Science Abstracts, Biosis Previews, GeoRef, Geoarchive, and Geobase. The Pelzer and Leysen article was obtained through the Genuine Article document delivery service. The Colorado Alliance of Research Libraries (CARL) UnCover database was also searched. The work of Bichteler and Ward was familiar to me through professional contacts.

INSTAAR is an interdisciplinary research institute with ties to the departments of Geological Sciences, Geography, Biology, Anthropology, and Civil Engineering, hence it represents a microcosm of the academic world. This multidisciplinary group has access to worldwide information sources ranging from home and office, to professional contacts, to library and information centers. These information sources are accessed both electronically and manually. INSTAAR's library collection is a central facility in the institute and is heavily used for research by faculty, research associates, and graduate students, and for course work by undergraduates. This collection consists of 2,000 monographs, 4,000 technical reports, and over 150 current journal subscriptions. INSTAAR is located approximately one and a half miles from the main campus where the University of Colorado Libraries offer their major collections to the researcher. Located on the East Campus with INSTAAR are the library collections of the World Data Center for Glaciology and the National Oceanographic and Atmospheric Administration branch library of the U.S. Department of Commerce Boulder Laboratories.

Methods

The following methods were used for the study:

1) Identification and description of a study group. The study group consisted of thirty-eight faculty members, research associates, and graduate students at INSTAAR. This participation represented a 97% response. The respondents' personal and professional characteristics are described below based on Page 1 of the questionnaire results (see following).

2) Formulation and distribution of a questionnaire. This questionnaire is attached as Appendix I. Pages 2 and 3 consist of 54 questions answerable in terms of frequency. Behavior experienced "often" is indicated by number 1; that experienced "sometimes" by number 2; that experienced "seldom" by number 3; and that experienced "never" as number 4. Although the questionnaire was based partly on previous work (Bichteler and Ward, 1988b; 1989) it was designed specifically to fit the needs of this study. The answers to the 54 questions were input on a spreadsheet using EXCEL on a Macintosh SE/30 computer. Each of the 54 columns of answers was tabulated by 1) frequencies and 2) percents of total. The tables for all 54 columns were scanned, and those with results that looked particularly interesting were tabulated and/or graphed (see under RESULTS).

3) Interviews were conducted with each individual in the study group. Interviews with students were geared toward determining their skills in library and information use. Interviews with faculty and research associates centered around their reprint collections. Although the information was not useful quantitatively nor for comparative purposes, it does shed light on information seeking behavior and has been used in this report.

Results

Characteristics of the Population Surveyed (Page 1 of questionnaire)

1. Students

Questionnaires were completed by 18 graduate students, the entire student population at INSTAAR.

Of these, one is a postdoctoral researcher; eight have completed an M.A. or an M.Sc., and nine have completed a bachelor's degree or equivalent. All but one of these degrees was completed within the past six years. Two of the students with bachelors' degrees are proceeding directly to the Ph.D.; therefore there are ten Ph.D candidates and seven candidates for the Master's degree in the study population.

Departmental affiliations of these students are as follows: one in the Department of Anthropology, one in the Basic Science Program, two in the Department of Geography, and the remaining fourteen in the Department of Geological Sciences.

Library use by these students draws them to 12 different libraries. They also use their professors' private collections and Interlibrary Loan. The highest number of libraries used by any individual was nine (by two respondents). Libraries used most are: the Earth Science Library branch of the University of Colorado Libraries - by 18; the Reading Room at the Institute of Arctic and Alpine Research - by 17; the Science Library of the University of Colorado Libraries - by 14; the National Oceanographic and Atmospheric Administration branch library of the U.S. Department of Commerce Boulder Laboratories - by 9; the World Date Center for Glaciology Information Center - by 8; the Math/Physics Library branch of the University of Colorado Libraries - by 6; and all others by 5 or less.

Journals regularly used by the largest numbers are: *Quaternary Research* - 11; *Arctic and Alpine Research* - 9; *Geological Society of America Bulletin* - 7; *Journal of Glaciology* - 5; *Geology* - 5; *Quaternary Science Reviews*, *Canadian Journal of Earth Sciences*, *Nature*, and *Boreas* - 3.

The most important purpose for seeking information was course papers (50%), followed by thesis writing (27%). Proposal writing, writing for publication in peer reviewed journals, and teaching were also listed as reasons for seeking information, as were personal and recreational interest.

2. Faculty and Research Associates

Questionnaires were completed by 20 of 21 faculty members and research associates. Within this group there are 6 faculty members, 13 research associates, and one person who is director of the Mountain Research Station operated by INSTAAR. (This person is considered a research associate for purposes of this study.) All of these persons have Ph.D's granted between 1957 and 1987.

Departmental affiliations of the group are as follows: one in the Department of Anthropology, three in the Department of Geography, and eight in the Department of Geological Sciences. The remaining seven have no departmental affiliation and do their research under INSTAAR auspices. Teaching responsibilities vary; most of those affiliated with departments are expected to teach whereas those without departmental affiliation are not.

Library use by these faculty and research associates draws them to 13 different libraries. The highest number of libraries used by any individual was 7 (by one). Four of them use six libraries, and many use at least four or five. Libraries used most are: the Reading Room at the Institute of Arctic and Alpine Research - by 20; the Earth Science Library branch of the University of Colorado Libraries - by 16; the National Oceanographic and Atmospheric Administration branch library of the U.S. Department of Commerce Boulder Laboratories - by 13; the World Data Center for Glaciology Information Center - by 8; all others by 5 or less.

Journals regularly used by the largest numbers are: *Quaternary Research*, *Nature*, and *Science* - 11; *Arctic and Alpine Research* - 8; and *Geological Society of America Bulletin*, *Journal of Glaciology*, *Geology*, *Quaternary Science Reviews*, *Boreas*, *Ecology*, *Journal of Geophysical Research*, and *Geochimica et Cosmochimica Acta* - 4.

The most important purposes for seeking information was clearly (65%) for publication in peer reviewed journals. Proposal writing was a distant second (15%). Faculty indicated library use for teaching an also commented that all other information contributes to teaching. "Other" information needs listed were "interest and curiosity," "self-taught subjects," and "recreation."

Information Sources (Page 2 of questionnaire)

This section of the questionnaire focused on three types of information sources: professional contacts, libraries and information centers, and home and office.[2]

Professional contacts

[2] The fourth section of this part of the questionnaire dealt with information format (document type) used. It is considered useful internally but not for purposes of this report.

Participants were asked to mark the frequency with which they used nine professional sources for supplying current information. Frequency was expressed in terms of "often" (indicated by number 1); "sometimes" (by number 2); "seldom" (by number 3); and "never" (by number 4). The most frequent professional sources used, as defined by "often" or "sometimes," were talking with colleagues, telephone, and correspondence (see Table 1).

TABLE 1
PROFESSIONAL SOURCES USED BY INSTAARs FOR CURRENT INFORMATION
(n = 38 responses)

Source	No. of "Often" or "Sometimes" Responses	% INSTAARs
Talking with colleagues	38	100
Telephone	35	92
Correspondence	31	82
In-house conferences	28	74
Electronic mail	20	53
Specialist meetings, workshops	20	53
Larger conventions	20	53
FAX	14	37
National Advisory Panels	07	18

The use of e-mail (53%) and FAX (37%) were broken down further to show relative use by faculty, research associates (RA's), and students. This breakdown showed that faculty were far more likely than research associates or students to use these sources. Eighty-three percent of faculty checked either "often" or "sometimes" as regards frequency of e-mail use, and 66% did the same as regards FAX use (see Figure 1 and Figure 2). On the other hand, 89% of students use e-mail "seldom" or "never," and 78% of students use FAX either "seldom" or "never." Frequency of use of these sources by research associates falls in between that of faculty and students (see Figure 1 and Figure 2).

FIGURE 1

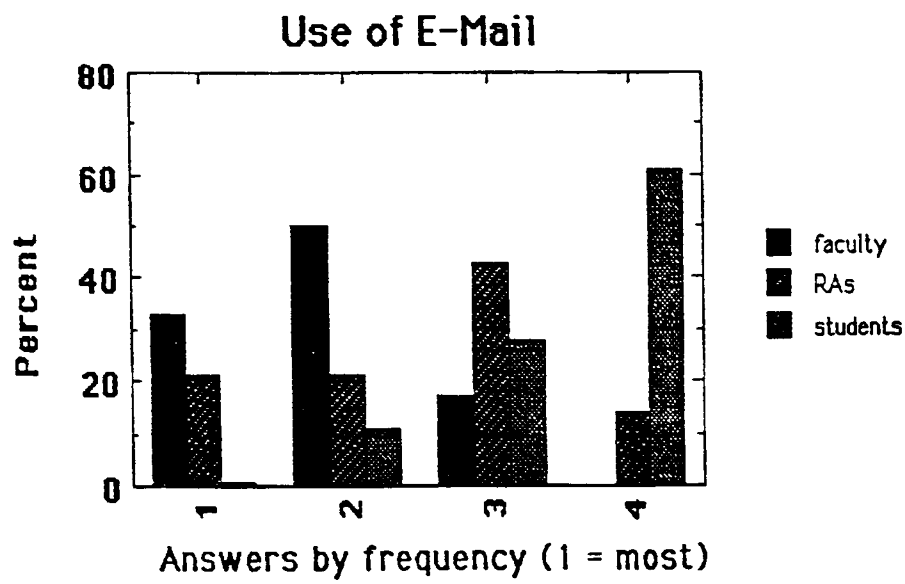
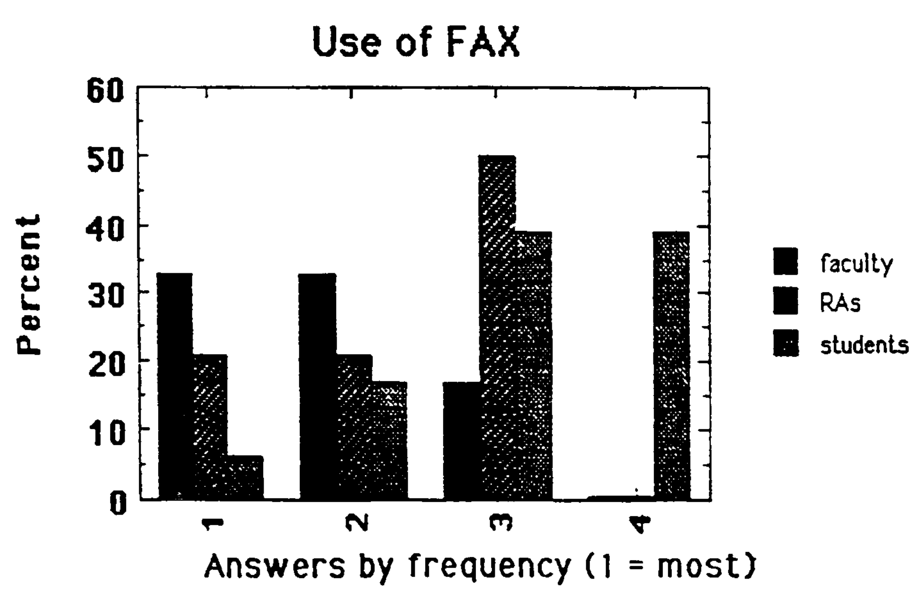


FIGURE 2



To find current information using library sources, 97% of those responding said they would "often" or "sometimes" use reference lists in articles. This source was followed by printed indexes and the University of Colorado online Public Access Catalog, know as CARL (Colorado Alliance of Research Libraries).[3]

TABLE 2
LIBRARY SOURCES USED BY INSTAARs FOR CURRENT INFORMATION
(n = 38 responses)

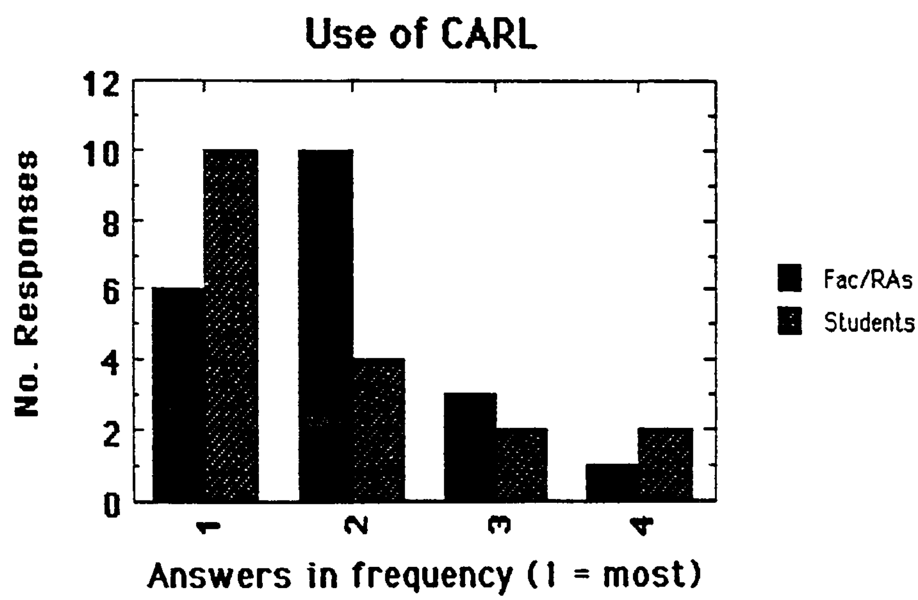
Source	No. of "Often" or "Sometimes: responses	% INSTAARs
References listed in articles	37	97
Printed indexes	31	82
Online catalog (CARL)	30	79
Browsing	29	76
Ask the librarian or staff	29	76
Card catalog	27	71
New book list/reviews	25	66
Printed "current contents"	21	55
Online journal contents	19	50
Online computer services	17	45
CD-ROMS	09	23

Further analysis of some of these sources shows the following:

More students use CARL "often" than faculty and RA's combined (see Figure 3). However, when "often" is combined with "sometimes," we see that 16 of 20 (80%) of faculty and RA's, compared with 14 of 18 (77%) students use CARL "often" or "sometimes."

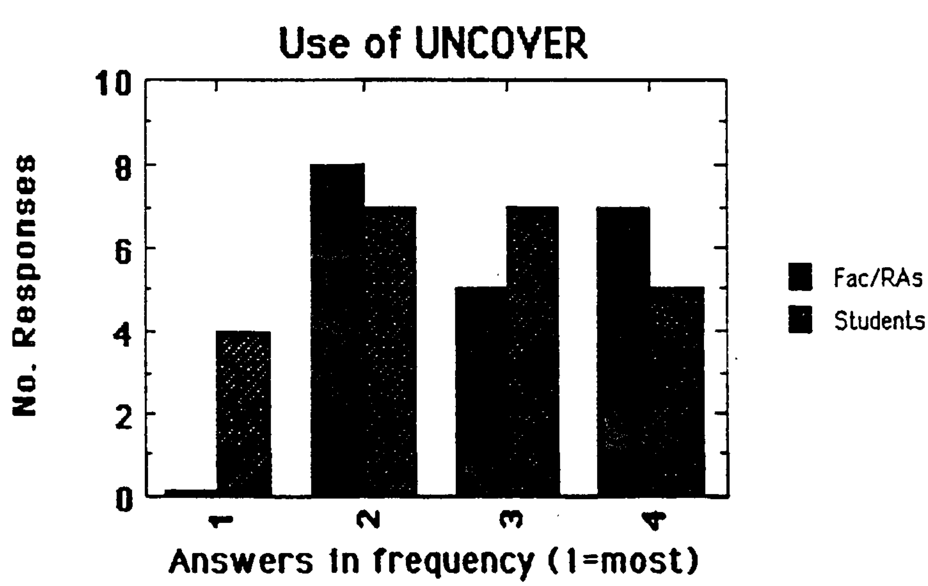
[3] The Carl system provides access to the library catalog for the University of Colorado at Boulder as well as to catalogs for almost all academic and public libraries throughout the state of Colorado and selected library catalogs in Arizona and California. Other services offered are a full text encyclopedia and two article access services.

FIGURE 3



On the other hand, the frequency of student use of UNCOVER, the online journal contents and article access service, is greater than that by faculty and RAs by any measure (see Figure 4).

FIGURE 4



Online computer services and CD-ROMs are used by only 45% and 23% of the respondents respectively. In these cases, faculty and RAs are more likely than students (50% to 38%) to use commercial online databases (see Figure 5) and almost equally likely (40 % to 38%) to use CD-ROM services (see Figures 6).

FIGURE 5

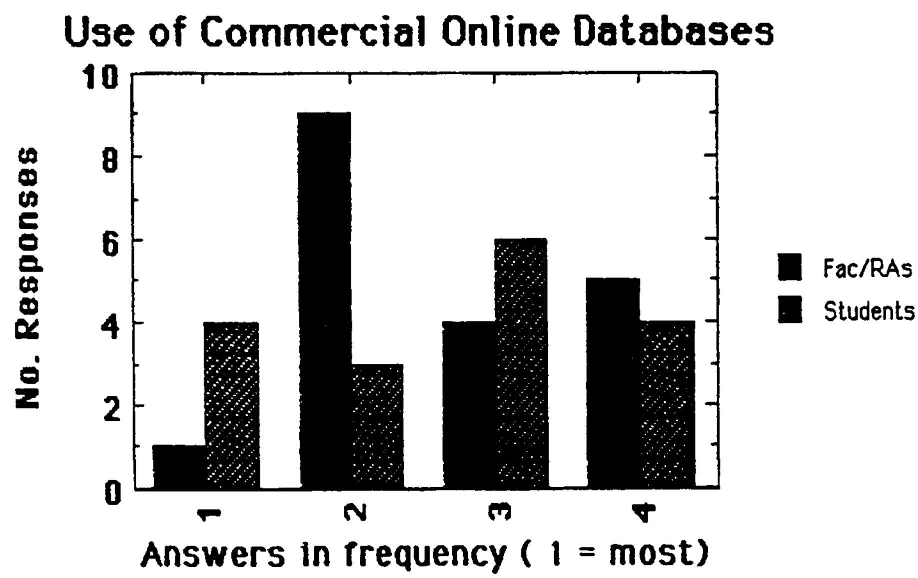
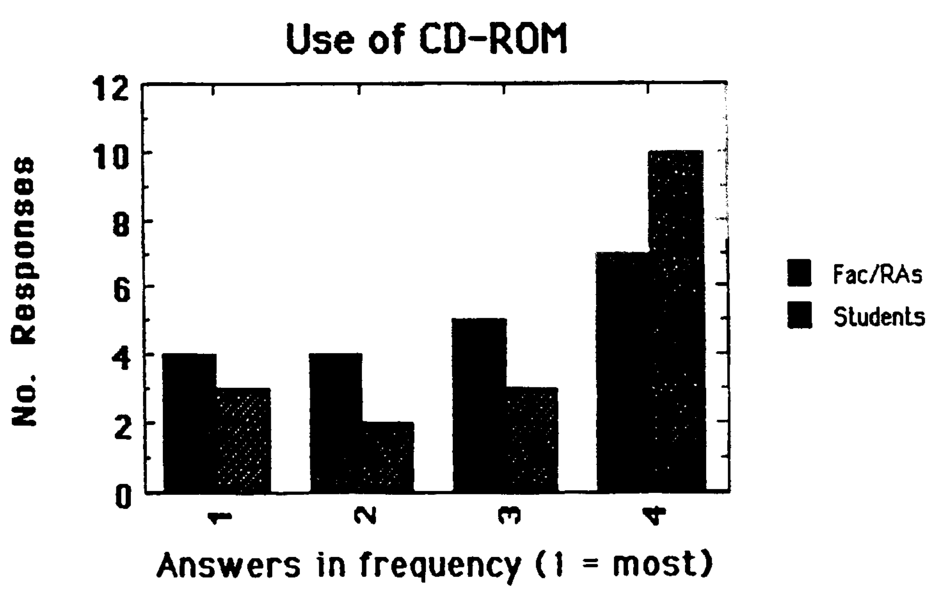


FIGURE 6



Home and Office

After the results were initially tabulated for this section, a decision was made to separate the question regarding personal use of microcomputers from the rest of the question. Therefore, the results are shown as Tables 3a and 3b. Reference to Table 3a shows that reprint collections are most frequently used among personal sources, followed closely by books and journals.

TABLE 3a
PERSONAL SOURCES USED BY INSTAARs FOR CURRENT INFORMATION
(n = 38 responses)

Source	No. of "Often" or "Sometimes" responses	% INSTAARs
Reprint collection	34	89
Book, thesis & report collection	32	84
Journal subscriptions	30	79
Card File	13	34

Answers to the questions regarding microcomputers to build and search bibliographic and numeric databases show a relatively negative response except in the case of use of microcomputers to build numeric databases.

TABLE 3b
PERSONAL SOURCES USED BY INSTAARs FOR CURRENT INFORMATION
(n = 38 responses)

Source	No. of "Often" or "Sometimes" responses	% INSTAARs
Microcomputer to build:		
Bibliographic databases	15	39
Numeric databases	20	53
Microcomputer to search:		
Bibliographic databases	11	29
Numeric databases	08	21

Problems in finding and using information (Page 3 of questionnaire)

Table 4 shows the most serious problems encountered by the respondents. Answers of "often" or "sometimes" by 14 or less respondents were not included. However, these were, in descending order: gray literature, financial costs and cost of online databases, search strategy construction, foreign language literature/publications, quality of information, unacceptable time for ILL delivery, and inadequate communication with a specialist.

Problems encountered were led by lack of time (73%). This was followed by inadequate library holdings (66%). A distant third (45%) was a three-way tie between out of print materials, inadequate access to library holdings, and physical access to materials. Last (39%) was lack of an adequate access system to personal collections.

TABLE 4
PROBLEMS ENCOUNTERED BY INSTAARs IN FINDING AND USING INFORMATION
(n = 38 responses)

Problem	No. of "Often" or "Sometimes" responses	% INSTAARs
Lack of time	28	73
Inadequate library holdings	25	66
Out-of-print materials	17	45
Inadequate access to library holdings (Govt. Docs, etc.)	17	45
Physical access to materials	17	45
Lack of adequate access system to personal collection	15	39

Interviews

1. Students

Students were interviewed about the following topics with a view to improving their success at library use.

User training.

All but one student reported that all of their courses required use of library material. All reported some kind of training - formal instruction, self-help, or individual instruction/help from a librarian. Most also reported themselves to be self-taught in the use of computers to search bibliographic databases.

Use of Printed Indexes and abstracts.

Most students were familiar with, and use, the printed bibliographies and indexes appropriate to their research area. These are: Geoabstracts (12 users); Ecological Abstracts (4); Cold Regions Research and Engineering Laboratory Bibliography on Cold Regions Science and Technology (4); and Arctic Bibliography (3). This topic is also dealt with quantitatively elsewhere in this paper.

Accessions lists from the most frequently used libraries - the Earth Science Library branch of the University of Colorado Libraries and the Reading Room at the Institute of Arctic and Alpine Research - are consulted by 1/3 to 1/2 of the students.

Use of Online Databases.

Forty-four percent of the students answered "often" or "sometimes" to the question on online computer services on Page 2 of the questionnaire. The interview conducted with the students bears out this data: GeoRef has been used by 9; COLD by 4; and Geobase and BIOSIS by 3 each. They are more likely to use CD-ROM databases. Thirteen have used OCLC's Selected Water Resources Abstracts and its Earth Sciences CD-ROM. A few students have used Dissertation Abstracts and NTIS on CD-Rom. The CD-ROMs are end-user searchable at no cost.

2. Faculty and Research Associates

Reprint collections.

Faculty and research associates were interviewed concerning their reprint collections. Nearly all interviewees indicated that their reprint collections were their first source of information, although at least two indicated that their own journal subscriptions were equally important.

Number of reprints. Numbers of reprints were estimated on the basis of file drawers filled in most cases. These numbers ranged from 1,000 to 7,000 reprints.

Arrangement of reprints.

Arrangement of reprints varied from "piles on my table" (from two younger researchers) to file drawers with either (1) an accession number arrangement with indexes for access to (2) arrangement by topic or author with no indexes for access.

Access to reprints.

No index. Eight respondents had no card (or computer) indexes to their collections. Their collections are arranged in various combinations of author, subject, and geographic area. Some had cross-references (by xeroxing the title page or whole article), and most had a separate file of most often used items.

Card indexes. Five respondents have card indexes to their files, by author. Two of these indexes are not current- one of the two has been switched to a computerized index. Another respondent has a card file that covers some items not contained in his reprint collection.

Computerized indexes. Five respondents have computerized indexes, using the following programs: Wordperfect, Pro-Cite, and Word.

Additional indexes. Three respondents keep bibliographies of over 1,000 items each on their personal computers to aid in their specific research. In the first case the bibliography is a cooperative effort of dendrochronologists over e-mail with monthly updates. In the second case, a bibliography has been developed for a large cooperative project in ecology. The third specialized bibliography was compiled by colleagues with a specialty in insects. These bibliographies are independent of each scientist's reprint collection although they may include items in the researchers collections.

Discussion of Results

Characteristics of the population surveyed.

Library use by the thirty-eight faculty, research associates, and graduate students involves as many as twelve or thirteen separate library collections. Most often used are the library collection at INSTAAR, the Earth Science branch of the University of Colorado Libraries and the Science Library of the University of Colorado Libraries. These three collections provide research materials in the fields of geology, biology, and geography, as well as specialized information on polar areas. The journals most frequently used, along with *Science* and *Nature*, are *Quaternary Research* and *Arctic and Alpine Research* and several geological journals. These numbers reflect not only the interdisciplinary character of INSTAAR studies in the Quaternary and polar regions, but also the current concentration of INSTAAR students in the Department of Geological Sciences. Perhaps not surprisingly, the students need is for information related primarily to course papers and thesis writing, while the faculty and research associates need information mainly to support their publication in peer-reviewed journals.

Information Sources

Professional contacts

Conversation with colleagues face to face, and by telephone, and through correspondence are the main source of information from professional contacts. Electronic mail and FAX, which are extensions of communication by correspondence, are becoming popular sources of information, especially among faculty and research associates who already have contacts in place.

Libraries and Information Centers

Questions pertained to use of all local area libraries and information centers. Almost 100% of respondents indicated that their first stop in hunting for references is to check the reference list at the end of a known article. Printed indexes, online catalogs, browsing, and asking the librarian were also considered valuable sources. Students are more likely than faculty and RAs to use the online catalog and its article access file UNCOVER "often." Online computer services and CD-ROMs are not widely used. Faculty and RAs are more likely to use the online services. On the other hand, CD-ROMs, which are searchable by the end-user, are used about equally by faculty and RAs, and students.

Home and Office

Personally held collections of reprints, books, theses, reports, and journal subscriptions are heavily used by all respondents. Microcomputers to build and search both bibliographic and numeric databases are infrequently used except to build numeric databases. However, some reprint collections are built and accessed in this manner (see above on "reprints").

Problems in finding and using information

Lack of time is the most prevalent problem in finding and using information. The rather serious charge of inadequate library holdings was leveled by 50% of faculty, 79% of research associates, and 61% of students answering "often" or "sometimes" to this problem. As many as 50% of RAs and 44% of students noted inadequate access to library holdings. The problem of physical access to materials reflects the distance between INSTAAR offices and the main campus libraries, and also the need for some researchers to use libraries outside of Boulder.

Interviews

Interviews of students found that they had all had some user training and were familiar with the printed indexes, and computerized services in their fields of study. Commercial online databases are not used frequently considering that this service may be obtained free. CD-ROMs, which they can search themselves, are more often used. The students are comfortable with being able to access other library catalogs of databases remotely (via CARL) and then use ILL, etc. to obtain materials not locally available. Students no longer expect to find needed documents physically present in one location; this does not seem to concern them especially as long as document delivery is possible.

Interviews of faculty and research associates regarding their reprint collection elicited a fascinating variety of responses. Perhaps all that can be inferred from these responses is that reprint collecting and accessing is a highly individualized procedure. These collections are highly valued by each collector and are their primary source of information.

Suggestions for improved information provision came mainly from students. With regard to the INSTAAR library collection they would like more journal titles and more books. An INSTAAR based computerized information workstation with CD-ROM capability is considered highly desirable to improve access to information. Some would like a computerized master list of INSTAAR reprints with holdings! Help with xeroxing and printing costs would be appreciated. An annual presentation to students in order to update information resources available was requested.

Conclusions

A perceived trend away from nearly exclusive use (among graduate students) of the INSTAAR library collection appears to be a result not so much of declining use of library materials as it is the necessity of using as many as a dozen different library collections to accommodate the 600% increase of scientific publication over the past 20 years.

Faculty and research associates, on the other hand, rely heavily on their extensive reprint collections in addition to using approximately the same number of libraries as the students.

Methods of access to needed references differs somewhat among the groups, with faculty and research associates extending their traditional "word of mouth" approach through electronic mail and FAX, and students being somewhat more likely to avail themselves of electronic access to catalogs and databases which are end-user searchable and not surcharged.

The main barriers to the acquisition of information are lack of time and inadequate library holdings. These problems can and must be addressed by librarians. Better service from librarians could minimize the lack of time needed by patrons. The charge of inadequate library holdings is more serious. It is no longer economically feasible for libraries to hold all materials needed by their patrons. However, familiarizing patrons with means of access to materials held remotely could go a long way to easing this problem. These conclusions are born out by the fact that while most respondents reacted positively to the provision of information for them, suggestions for improved information delivery varies, from augmenting INSTAARs collection, to various improvements in access facilities at INSTAAR.

ACKNOWLEDGEMENTS

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Appendix I

Name:_______________

QUESTIONNAIRE

PERSONAL AND PROFESSIONAL CHARACTERISTICS

Academic status:

Student
Research Associate
Faculty
Departmental affiliation
Highest earned degree
Date of highest earned degree

Libraries used: (rank in order of use)

INSTAAR	1.__________
WDC-A, Glaciology	2.__________
NOAA - main or branch	3.__________
NCAR	4.__________
Colorado School Mines	5.__________
USGS	6.__________
University of Colorado Libraries	
- Earth Sciences	7.__________
- Science	8.__________
Other (specify)	9.__________

Please list titles of journals that you read regularly in connection with your research, in order of importance

____
____
____
____
____

PURPOSES FOR SEEKING INFORMATION

Are your current information needs related to: (rank)

Proposal writing	1.__________
Thesis writing	2.__________
Course papers	3.__________
Publication in peer reviewed journals	4.__________
Teaching	5.__________
Other (specify)	6.__________

INFORMATION SOURCES

Please indicate the frequency of your use of the following information sources

1 OFTEN 2 SOMETIMES 3 SELDOM 4 NEVER

Professional Contacts				
Telephone	1	2	3	4
Talking with colleagues at work	1	2	3	4
Correspondence	1	2	3	4
Electronic mail (no contacts/week = ____)	1	2	3	4
FAX	1	2	3	4
In-house conferences (i.e. weekly project meetings)	1	2	3	4
National advisory panels	1	2	3	4
Specialist meetings, workshops, short courses (no./yr. = ____)	1	2	3	4
Larger conventions (no./yr. = ____)	1	2	3	4
Libraries and Information Centers				
Ask the librarian or staff directly	1	2	3	4
Printed indexes or bibliographies	1	2	3	4
Printed "current contents" lists	1	2	3	4
Online journal contents access such as "Uncover"	1	2	3	4
Card catalog	1	2	3	4
Online catalog (CARL)	1	2	3	4
Browsing book stacks	1	2	3	4
Reference lists at end of relevant articles, reports or books	1	2	3	4
New book announcements or book reviews	1	2	3	4
Online computer services (GEOREF, BIOSIS, GEOBASE, etc.)	1	2	3	4
CD-ROM services (OCLC Earth Sciences, etc.)	1	2	3	4
Home and Office				
Card file	1	2	3	4
Reprint collection	1	2	3	4
Journal subscriptions	1	2	3	4
Book, thesis and report collection	1	2	3	4
Microcomputer or terminal to search:				
Bibliographic databases	1	2	3	4
Numeric databases	1	2	3	4
Microcomputers to build your own:				
Bibliographic databases	1	2	3	4
Numeric databases	1	2	3	4
Information format (document type) used:				
Book	1	2	3	4
Journal	1	2	3	4
Government Document	1	2	3	4
Map	1	2	3	4
Aerial photographs	1	2	3	4
Reprints	1	2	3	4
Specimens (soil, vegetal, etc.)	1	2	3	4
Other (specify):	1	2	3	4

PROBLEMS IN FINDING AND USING INFORMATION

Please indicate the frequency of your experience of access and retrieval problems as follows:

1 OFTEN 2 SOMETIMES 3 SELDOM 4 NEVER

Access:				
Lack of time	1	2	3	4
Lack of adequate access system to personal collection	1	2	3	4
Out-of-print materials	1	2	3	4
Inadequate library holdings	1	2	3	4
Inadequate access to library holdings, i.e. Government documents indexing	1	2	3	4
Physical access to materials	1	2	3	4
Quality of information??	1	2	3	4
Unacceptable time for ILL document delivery	1	2	3	4
Gray literature?	1	2	3	4
Financial costs	1	2	3	4
Foreign language literature	1	2	3	4
Inadequate communication with a subject specialist?	1	2	3	4
Retrieval:				
Indexing terminology	1	2	3	4
Search strategy construction	1	2	3	4
Cost of online databases	1	2	3	4
Foreign language publications	1	2	3	4

ECOLOGICAL INFORMATION: A DIALOGUE BETWEEN PRODUCERS AND USERS

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Abstract

The data distribution and concentration optimum are considered. The coordinated network of specific collections is required on the base of active interaction of resources. The local resources potential is misused now and the dynamics of information flows is affected. Creating the local gathering, storing and distribution units proves helpful for the gray literature circulation especially for the *Annals of Nature* outflow. The users' demands are studied in the context of a three-staged 1983-1991 survey held among the reserve managers and ecologists. The priorities in using different channels of getting data are chosen.

Introduction

The territorial and information remoteness of protected areas, especially the polar nature reserves Kandalakshsky, Laplandsky, Tamirisky and Vrangel Island, make the discussion about the ecological knowledge sharing more than actual. Analyzing the present information situation in the ecology realm and observing the gap between the producers and users it is important to examine the process of information stream as a system function. Considering the system of ecological information as a unity of mutually related parts: document (primary of factual information) - information office, library - (secondary information) - user. It is assumed that each of these parts has its own complicated structure with the specific functions and links. The vital issue enters the current agenda: to reveal the correlations between the parts composing this system. The organization and function structure of the ecological information system now presents a rather complicated, multi-layered form with numerous isolated sets. The problem of system management at all the levels (local, regional, national), as well as the proper, well arranged interaction between the information offices and libraries becomes critical.

Seeking New Ways and Forms

The qualitative changes of the national economy touch upon all the internal and external economic relations. Gradually the sphere of these relations is spreading over the science field. The statewide System of Scientific and Technical Information (GSNTI) functioning since 1971 is transforming under the influence of the market economy. Along with conserving the resources a careful balance between the state and the market sections of the information activities should be found. In this connection, the division of information into two types: scientific/technical and business/commercial/industrial (Seiful-Muliukov, 1991) is perhaps understandable. Nevertheless it is sometimes rather hard to find this watershed, for instance in the nature conservation realm. The draft concept of information supply of the scientific and technical progress management foresees three main trends in information development: forecasting analysis and examination; information and analytical monitoring; and designing the specialized data bases (Gubanov, 1990). Different versions of the new functional structures are proposed, but the ideal of using the former infrastructure in order to establish Centres of Information Analysis seems to be the most reasonable. About thirty Centres of Information Analysis with a network of 560 sources of information are to be designed (Teretshenko, 1991). This approach uses the same principles of GSNTI of subdividing the Centres into state, republic, territorial and branch. But the agreed concept of building a network for ecological centres still lacks the rapid, spontaneous appearance of local data bases. Officially about 160 organizations of state and branch subordination design the automation systems on ecology (Teretshenko, 1991). Nevertheless the subject blocks of the mentioned systems neglect the large block of the living nature resources.

Information Being Offered

More than 200 titles of primary editions on ecological problems have been recently available. This number has included the profile publications, periodicals, and serials. It many be noted that the scientific periodicals edited by the Academy of Sciences include Proceedings..., Papers, and Achievements in Modern Biology. Much interest was aroused by the serials of Collections and Transactions prepared and edited by the research institutes. Investigations carried out by the high school scientists are reflected on the pages of the *Proceedings of High School* and the *Scientific Papers of High School.*

As for the secondary information it can be admitted that a complex of bibliographies, abstracts and reviews exists. The most active producers are the states and branch information offices and libraries. The Institute of Scientific and Technical Information devises the bibliography '*Biology*', signal information '*Conservation of Plants and Animals*', abstract information '*Problems of the Environment and Natural Resources*', abstract journals '*Biology*', '*Botany*', '*Zoology*', '*General Ecology*', '*Geography*', '*Environment Protection*', '*Nature Conservation and Restoration of Natural Resources*', express information '*Legislation on Environment*', and the review, '*Environment Protection*'. The Scientific and Technical Centre plans for publication of the bibliography '*Registration Bulletin of Research Projects - Environment Protection*' and abstract information, '*Scientific and Technical Collection of Abstracts - Environment Protection*'. The Centre of Trans-lations offers the bibliography '*Translation Index - Environment Protection*'. The current bibliographies '*Problems of the North*', '*Nature Conservation of Siberia and Far East*', '*Soils, Plants and Animals of Siberia and Far East*' are published by the Public Scientific and Technical

Library. The Library on Natural Sciences edits a series of bibliographies and subject indexes including the serial '*Man and Biosphere*'. This brief list does not fully show the heterogeneous structural contents of ecological information stream which is based on the general principles of specialization and branch affiliation. The latter should be supplemented by the principles of integration and coordination of producers' activities within the special ecological network.

Ecological Funds: Towards a Network

Besides the major information offices and libraries the different types of the local ecological collections are affiliated with specific organizations. Most of these funds are isolated from each other though the pressing necessity to exchange research data make them pool the resources. Unfortunately the idea of establishing the network of ecological funds has not attracted yet all those interested. This also concerns the data bases and banks of ecological information. Huge efforts are made though the result is often far from being promising. It is time to carry out the census of the information sources, to prepare a kind of inventory of units holding the scientific data of local, regional and national significance. Thus an attempt has been made to shape a pre-network embracing the existing funds in the relevant research institutes and nature reserves. The resources potential of libraries were studied and generalized. The essential roles in the future network must be equally shared between the aforementioned funds. Some common traits of the funds are noted, especially for the reserves libraries. Despite the fact that the number of readers may vary from 1 to 85 users, the staff rarely exceeds 1 librarian, often a volunteer. The services offered include: loan, referral and consulting facilities, exhibitions of new acquisitions, and subject collection of literature. The libraries are completed by the Union-Press, information offices and privately. The collections are mainly comprised of the national profile and rarely foreign literature. Gray literature is presented by the reports, plans and Annals (Chronicles) of Nature. This annual yearbook contains unpublished output of the long-term monitoring of the natural processes given the full and variable description of natural phenomena. The data sets cover such features as territory (total area, boundaries), water supply, flora and vegetation (list and description of plants, forest valuation of the experimental plots, forest firs fixation), fauna and animal kingdom (accounts of all species, observation and losses data), research and activities. This brief outline does not fully reflect the amount of all the gathered information on the local level. The next step that should be taken is to integrate the primary data and to present it in a manageable form. On the whole these databases would form a territorial and/or regional system and open access for external usage. The great value of the gray literature should not be reduced by the technological constraints of integration. The isolation of the local collections affects the dynamics of the information flow and the mutual influence of the theoretical and applied aspects. So it is reasonable to establish the local gathering, storing and distribution offices in the nature reserves. The exchange of bibliographies, indexes and guide-lists will promote to discover the sources necessary for the proper supply. Active contacts between the producers and users may be considered as an index of the systems' effectiveness. Ecologists occupied in the protected areas need the rapid, reliable and detailed data on the similar studies. At the same time they dispose of valuable first-hand data on the natural processes. So the target is to arrange the pertinent feedback.

User's Opinion

The survey (1983/1991) held among the nature reserve managers and ecologists was to study and analyze the strategic, tactical and current information needs. The survey program consisted of three stages for getting and handling the data, fixing the regularities and tendencies, and working out the recommendations. The protected areas of the former union republics were chosen as the experimental background. Following four criteria (scientific affiliation, geographic representation, functional importance in the general network, department subordination) the questionnaire was sent to 152 state reserves, 10 reserve-hunting units and 7 national parks. Twenty three questions listed on the form have covered the issues on the classification of users, contents of common and specific needs, peculiarities of using the primary and secondary information, scientific contacts, status and structure of the branch needs tendency in needs development. According to the positions the respondents are divided into 6 main groups: D - director (5.6%), DD - deputy director (7.9%), LR - leading researcher (1.2%), SR - senior researcher ((54.0%), JR- junior researcher (29.1%), and SA - senior assistant (2.2%). The difference in the channels of communication used is observed. In order to find the domestic information the D, DD, LR, and JR groups use the formal channels, in particular the primary sources (monographs and articles), and the SR group gives priority to the informal channel (the private contacts). The usage of the foreign sources of information is still different. The D and DD groups prefer the primary sources (monographs and articles), while the SR, JR, and SA groups choose the abstracts journal. The unpublished editions are seldom demanded. The scale of using the informal channels for foreign information is low for all of the groups. This shows the limited contacts with the national and foreign information holders.

The total number of the national periodicals used by the researchers reaches 40 titles, including 28 central branch journals, 8 editions of the central and local scientific institutions, 2 bulletins of societies and 2 serials of the high schools published in Russia, the Ukraine, Siberia, and the Far East. The journals of *Ecology*, *Journal of Zoology*, *Journal of General Biology*, *Journal of Botany*, *Bulletin of Moscow Society of Nature Investigators (MOIP)*, and *Herald of Zoology* have the highest rating indexes. The primary editions are most frequently demanded at the preparatory stage of the research process though the mean quantity of titles used at all the stages is 4.0. The foreign periodicals chosen by the researchers include 66 titles (in English - 60%, in German - 20%, in Polish and Czech - both 7%, in Swedish - 6%). Among the most popular mentioned are: *Journal of Ecology*, *Environment*, *Animals International*, *Biological Conservation*, and *American Birds*. All of them have the multi-subject orientation and may be included in the list of answering the strategic needs.

The average number of the secondary editions used by the respondents is different depending on the positions, thus the D group applies for 6 titles, DD - 4.2, SR - 3.6, JR - 3.0, LR - 2.0, SA - 1.5. A total of 21 titles of the national secondary editions are inserted into the list of the required literature. The leading positions are given to the *Abstracts Journal - Nature Conservation and Natural Resources* (Institute of Scientific and Technical Information), *Collection of Abstracts, Environment Protection* (Scientific and Technical Centre), *Abstracts Journal - Nature Conservation* (Research Institute on Agricultural Information), *Annals of Articles, Book Annals* and *Agricultural Literature.* The foreign secondary editions are presented by 12 titles. The highest grade is given to *Wildlife Review, Science Citation Index* and *Environment Abstract.*

The high quality second editions, in users' opinion, must be prompt, complete, accessible, regionally specific and handy. The most important characteristics for the bibliographies are completeness, accessibility and regional affiliation, for the abstracts - promptness while for the reviews - accessibility and completeness. Thus the bibliography is to contain the detailed description of documents in the maximum brief form and broad scope. Concerning the preferable forms of the secondary information the majority of the respondents have chosen the abstract (73.8%), followed by annotation (18.7%), bibliographic description (4.7%), author's abstract (1.9%) and the contents (0.9%).

A short scheme of seven main supply forms shows that the library-bibliographic facilities are actively used by 50.4% of the researchers while the others (facilities for the leaders, SDI, information support of a definite theme/research project, patent supply, factual data support, computer facilities) are weakly developed and adopted.

All the information offices and libraries that provide the users with the required literature are split into local, territorial, republic and state. The most active linkage is fixed with the local libraries placed in the protected areas, universities and research institutions and secondly with the state libraries. Less contacts are revealed with the territorial and republic libraries. Almost the same situation can be observed with the information offices. They hold the first place while the local offices take the second one.

Another section of the survey program concerns the structure and forms of the exchange stream with the national and foreign scientific organizations. For instance, the researchers prefer to get transaction, prints, journals, books and abstracts through the national exchange stream and prints, abstracts, journals, transaction and books via the international stream.

Finally the majority of the respondents admit that the trends of interaction with national and international partners should be : (a) exchange of information by the formal and informal communications channels, (b) establishment of common databases and data banks on the environment, and (c) involvement into the regional and global ecological networks.

Training Programs

Insufficient knowledge and poor skills in the information and library sciences make the users continually and refresh their education. Several lectures on the principles of scientific information elaborated for ecologists contained the divisions: (1) state and branch systems, documentary streams, referral and information funds, types of information supply, handling of information, registration of research projects, exchange system, (2) bibliographic information: structure, classification systems, editions, supply, (3) patent information, standards, and (4) international cooperation. Some of these aspects were tested at the seminars for the reserve officers in 1984-1988. Later on the program was changed and supplemented.

This year the Institute of Retraining the Information Officers tried another program intended for professionals in ecological information. A group of 10 listeners attended lectures for a week on a commercial basis. It is evident that the program was a success but needs some corrections.

Conclusion

The further development of the ecological information system should keep the following priorities:

- to design the united, decentralized, system of gathering, handling, storing and distribution of ecological information; to establish the specialized network of ecological funds; and to concentrate the factual data in local and regional blocks;

- to differentiate the functions of information offices, to shape appropriate forms of rational inter- and intra- branch cooperation; to develop cooperation on different levels, to stimulate the vertical and horizontal interaction on bilateral and multilateral basis;

- to coordinate the information stream on the national and international levels; to elaborate the relevant types of editions to provided the unity and coincidence of supply;

- to ensure monitoring of users' needs, revealing the priorities and requirements to the information supply;

- to provide the access to the national and international systems, to determine the conditions of the proper and effective exchange procedures;

- to work out the project aimed at developing the general concept, theoretical background and practical arrangements.

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THE CANADIAN POLAR INFORMATION SYSTEM USER SURVEY

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Abstract

A survey of potential users of a Canadian Polar Information System (CPIS) was conducted between December 1990 and February 1991. A detailed questionnaire was mailed to 897 potential CPIS users, and 257 completed questionnaires were returned. The amount and quality of information received was excellent. As with other CPIS background studies, a group of 18 participating specialists reviewed the study methodology and final report. The survey showed a high level of support for a CPIS, and gathered opinions on everything from the geographic coverage of the system to the prices to be charged for its products and services. This paper summarizes the survey results.

Introduction

Since 1987 the Arctic Institute of North America (AINA) and the Canadian Circumpolar Library (CCL, formerly the Boreal Institute for Northern Studies Library) have been working to stimulate discussion about a Canadian Polar Information System, and to build a consensus on how such a system might be created and what services it might provide. The report *Sharing Knowledge, Sharing Resources: A Plan for a Canadian Polar Information System* (Minion and Goodwin, 1991) summarizes our CPIS design efforts to December 1991. A paper elsewhere in this proceedings updates that information to April 1992.

Between 1989 and 1991 the Circumpolar and Scientific Affairs Directorate of Indian and Northern Affairs Canada funded our organizations to undertake three background studies on aspects of the CPIS design. This paper describes the third of those studies, a survey of potential users of a CPIS. The final report of the study (Goodwin and Minion, 1991) provides a more detailed description of the methodology and results.

Methodology

This study surveyed potential users of a Canadian Polar Information System to examine their needs for polar information. The survey questionnaire and mailing list were developed in consultation with a group of interested polar information specialists. The survey was successful in terms of both overall response rate and the quality of information obtained from the respondents.

Participating Specialists

As with the two earlier CPIS background studies, an important part of the methodology of this study was the active involvement of a group of eighteen experienced information specialists with an interest in polar information. (The specialists' names and affiliations are listed in the Acknowledgements at the end of this paper.) Specialists were chosen to represent organizations that have recognized expertise in information systems design, that are potential participants in CPIS, or that are potential large-scale users of CPIS. Many of the organizations represented fall into more than one of these categories. They also represent a good geographic, linguistic and sectoral cross-section of Canadian organizations with an interest in polar information.

The participating specialists were involved in this study at three points. First, they were asked to comment on a draft version of the study questionnaire. They made a series of suggestions that significantly improved it. Second, they were asked to provide, from their own networks of contacts, names of persons to be surveyed. Approximately one-third of the persons to whom the questionnaire was mailed were suggested by the participating specialists. Third, the participating specialists commented on, and suggested changes to, a draft version of the final study report.

The involvement of this group of information specialists in the CPIS background studies has had several benefits. It has allowed many of the people who will be building and operating CPIS, as well as some of the larger users of the system, to be directly involved in the detailed decision-making about the system's design. It has ensured that the studies incorporate a much broader spectrum of opinion than if just the two authors had contributed to them. It has also begun the process of building a team of individuals and organizations that can assist in future CPIS studies and ultimately in the construction and operation of the system.

The Questionnaire

The questionnaire used in the study was four pages long, and included a brief introduction to CPIS, a plea for a high response rate, a deadline for return, a section for information about the respondent, and then several sections seeking the respondent's opinion about unresolved aspects of the CPIS design. The questionnaire contained a considerable amount of text, and required a significant commitment of time and thought on the part of respondents. This seemed unavoidable if we were to ask all the questions that needed to be asked, while making the questions sufficiently detailed to ensure that they were understood. While some respondents did not reply to every question (the questions about product prices were the ones most frequently left blank), their comments indicated that this was usually because they felt unqualified to give an opinion, rather than because they failed to understand the question. In retrospect we were very pleased with the design and wording of the questionnaire.

The Mailing List

In developing a list of persons to be surveyed we were faced by the fact that there was no way to identify the population from which we wanted to draw a sample. Potential polar information users could be anywhere, but a random sample chosen from the entire Canadian population would have to be very large in order to contain enough potential users to provide useful information. A paper presented at the 1989 Toronto Conference on Database Users describing a study of online information use by Canadian companies could equally well have been referring to a study of polar information users:

> *In fact, I do not think we will ever be able to do a quantitative analysis of the Canadian market; it is impractical at this point. Users, as we found out in Phase I of our study, are impossible to find through any kind of random sampling. The using organizations are widely dispersed. The proportion of using companies over the total population might be very small. In addition, end users generally can be anywhere, so we cannot make the assumption that a small information-intensive company is not a heavy user of online information.* (Ritchie, 1990, p. 36)

We therefore concluded that the best approach was to choose a sample that was relatively rich in potential polar information users, recognizing that this would allow us to determine a lower limit for the size of the CPIS market but that extrapolation to determine the total size of the market would be very difficult.

Addresses from the following sources were used to create a mailing list for the survey questionnaire:

- Those who we knew were already interested in CPIS, including our participating specialists, people who had sent comments on earlier CPIS reports and those who had asked to be placed on a CPIS mailing list.
- Existing customers of AINA and CCL information products, including the *ASTIS Current Awareness Bulletin*, the *ASTIS Bibliography*, the Boreal *Library Bulletin*, *Boreal Northern Titles*, and all Boreal Library interlibrary loan clients for the year ending June 1990.
- Attendees at some recent multi-disciplinary northern conferences: *The Role of Circumpolar Universities in Northern Development* in Thunder Bay, November 24-26, 1989; the Science Council of Canada's *Northern Science for Northern Society* in Yellowknife, March 20-22, 1990; the *Workshop on Yukon Information and a CPIS* in Whitehorse, April 25, 1990; and the *Thirteenth Polar Libraries Colloquy* in Rovaniemi, Finland, June 10-14, 1990.
- Members of the Council of the Association of Canadian Universities for Northern Studies.
- Persons suggested by our 18 participating specialists from their own networks of contacts. In addition to providing new addresses the participating specialists reviewed those addresses from their region that were already on the list, making corrections and adding personal names.

The 1092 addresses from these sources were keyed into a small database and duplicates were removed, resulting in a final list of 897 addresses. 705, or 79%, of the addresses contained a personal name, the remainder being addressed to positions or organizations.

Survey Response

The English version of the questionnaire was mailed between November 29 and December 3, 1990, with a deadline for response of December 31. The French version of the questionnaire was mailed December 3, with a deadline for response of January 10, 1991. The purpose of the deadlines was to discourage procrastination, and all questionnaires received up to March 8, 1990 were included in the analysis of results. As of that date 257 completed questionnaires had been returned. 10 questionnaires were returned by the Post Office because the addressee had either moved or died, meaning that 887 questionnaires were delivered. The survey response rate, as a percentage of delivered questionnaires, was therefore 29.0%. We consider this to be a good response rate for a survey of this type. A recent survey of CD-ROM use in Canadian libraries, for example, reported a response rate of 25.6% (Fox, 1990).

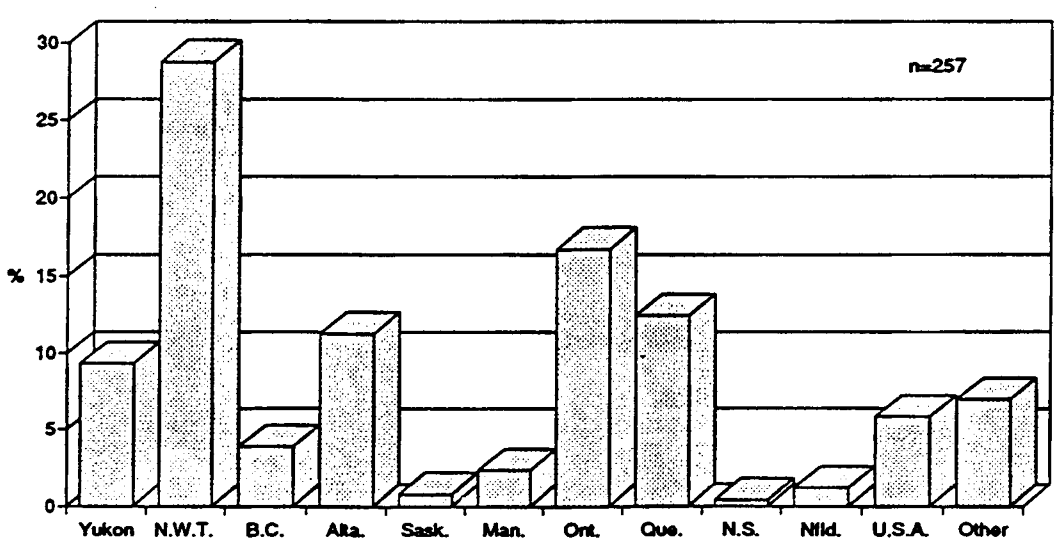
The survey results are discussed in the following sections in the same order that the questions appeared on the questionnaire. Results are given in graphical form. The number of respondents who answered a question is noted on the graph ("n="), and in most cases results are given as a percentage of this number. We have not looked at how respondents' answers to our questions about CPIS vary with the respondents' characteristics. For example, the desired southern limit of geographic coverage might depend on where in Canada the respondent lives. Because we believe our sample to be broadly representative of the potential users of CPIS we would not expect an examination of such variations to significantly affect the CPIS design. The results of the survey will be retained as a machine-readable database in case we, or others, wish to extract such information in the future.

Characteristics of the Survey Respondents

Respondents' Locations

Information about the geographic locations of survey respondents was extracted from their addresses. The results are shown in Figure 1. We were particularly gratified to see a large number of survey responses from northern Canada. This was due partly to a deliberate effort to include northerners in the survey mailing list, and partly to a

Figure 1 - Respondents' Locations

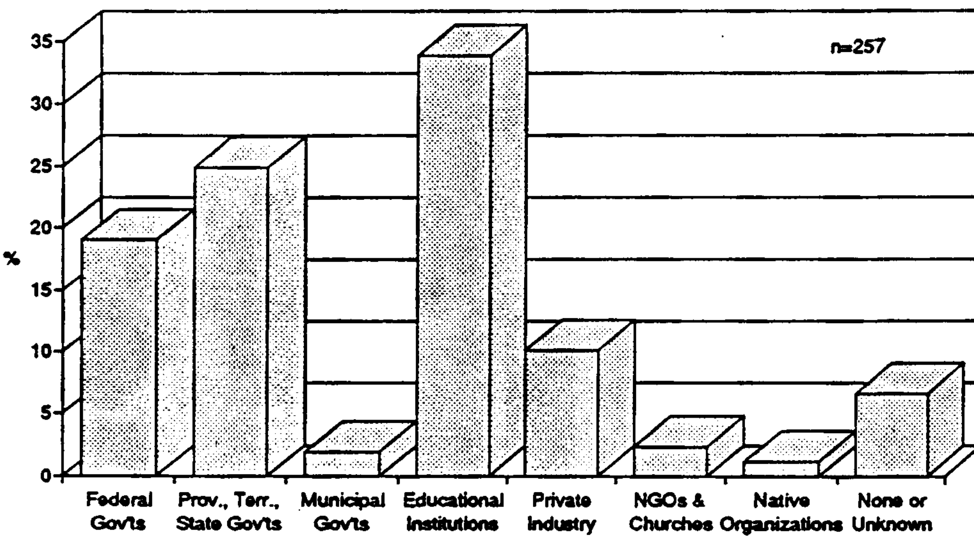


higher response rate from northerners. The response rate from the N.W.T. was 49.3%, and from the Yukon 37.5%, compared to 23.6% for all other regions combined. There is clearly a great deal of interest in CPIS in the North.

Respondents' Organizations

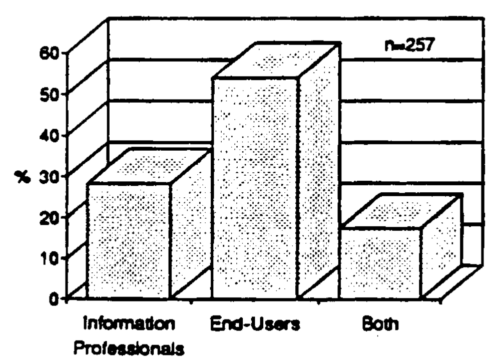
The types of organizations for which survey respondents worked was determined from respondents' addresses. The results are shown in Figure 2. The "Educational Institutions" category contained mostly university addresses, with some colleges and a few schools. The "None or Unknown" category contained respondents who gave a residence address. The distribution of respondents by organization type corresponds to the pattern seen in existing AINA and CCL information products, with governments the largest user, followed by universities and then the private sector.

Figure 2 - Respondents' Organizations



Respondents' User Types

Figure 3 - Respondents' User Types

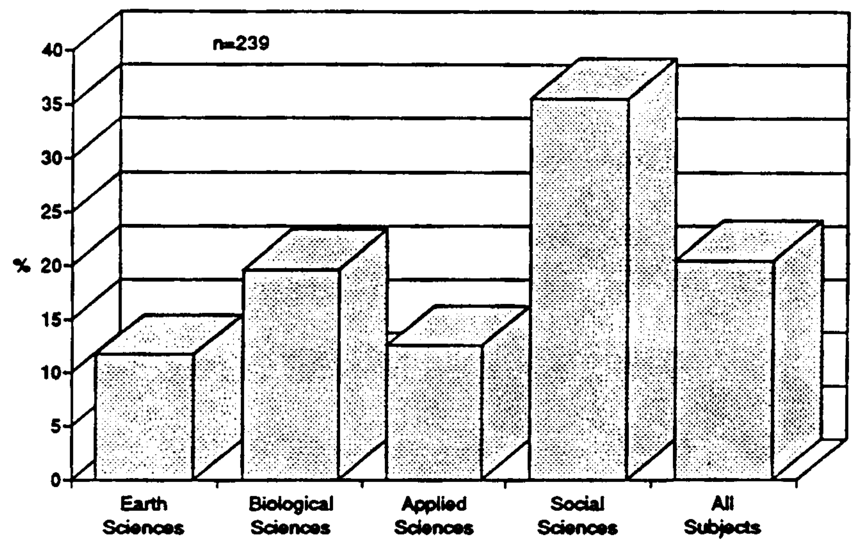


The responses to this question are summarized in Figure 3. We were somewhat surprised at the large number of respondents who considered themselves to be both information professionals and end-users. In retrospect it might have been better to force respondents to make a choice between the first two categories and eliminate the third.

Respondents' Subject Interests

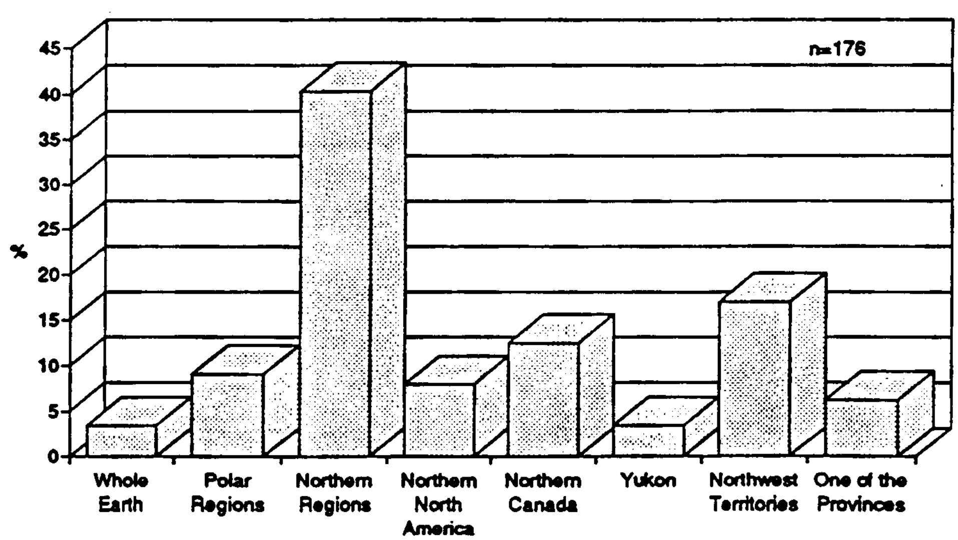
The subject interests of respondents were categorized, based on the keyword descriptions that most respondents provided. The results are shown in Figure 4. Only a few broad categories were used, so that each questionnaire could be quickly assigned to a single category.

Figure 4 - Respondents' Subject Interests



We assume, based on the way that our sample was chosen, that this distribution of subject interests reflects the subject interests of the entire population of potential CPIS users. Since CPIS will cover all subjects, this information will not have any practical effect on the design of the system.

Figure 5 - Respondents' Geographic Interests



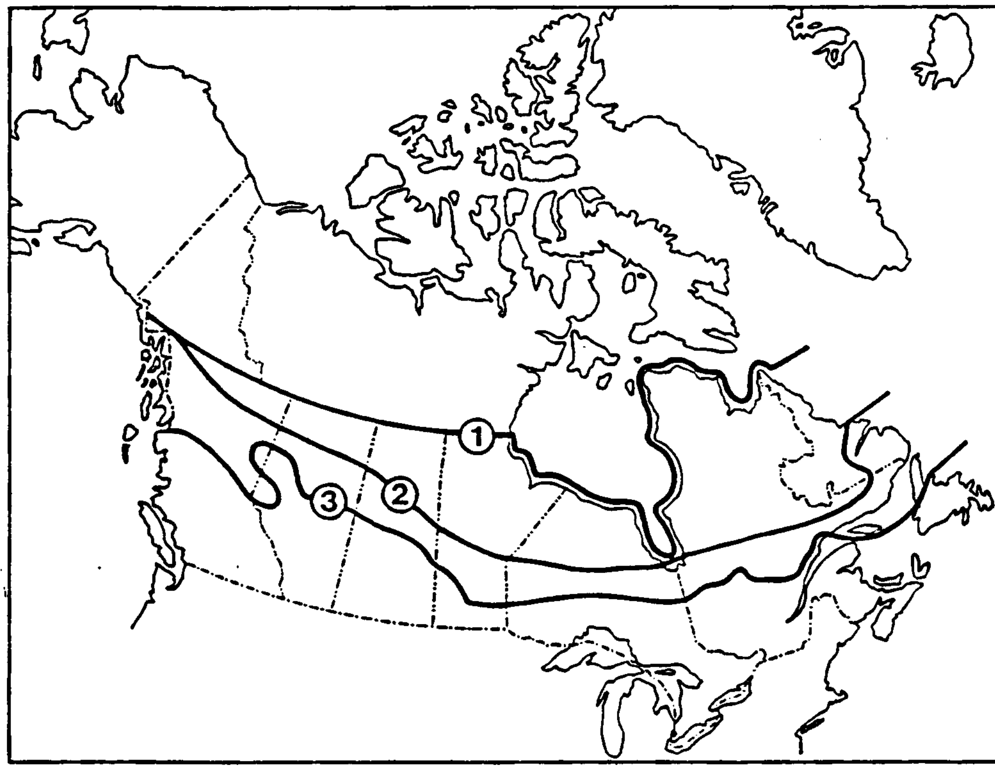
Respondents' Geographic Interests

The geographic interests of respondents were also categorized, based on the keywords supplied by the respondents. The results are shown in Figure 5. Once again the categories were kept fairly broad.

It is a relatively safe assumption that this distribution of geographic interests represents that of the population of potential CPIS users. There is clearly a large group of people that is interested in information about all northern regions, not just northern Canada.

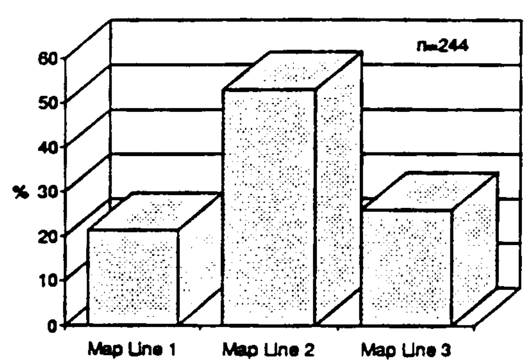
What Geographic Region Should CPIS Cover?

Desired Southern Limit of Canadian Coverage



As shown in Figure 6, line 2 on the map is preferred as the border of CPIS' coverage within Canada. We conclude that CPIS should use this line, the southern limit of discontinuous permafrost, as the southern border of the system's Canadian coverage.

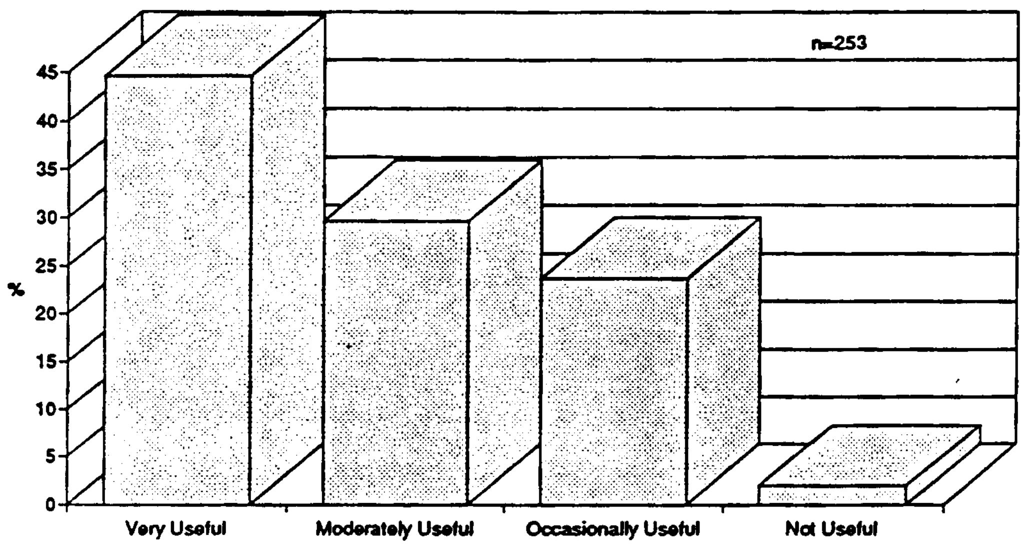
Figure 6 - Desired Southern Limit of Canadian Coverage



Usefulness of Information About Non-Canadian Arctic Regions

As shown in Figure 7, there is considerable interest in information

Figure 7 - Usefulness of Information About Non-Canadian Arctic Regions



about non-Canadian arctic regions among potential CPIS users. This response is consistent with the earlier question in which respondents described their geographic interests (Figure 5). CPIS will clearly have to make information about non-Canadian arctic regions available to its users. This could probably be most efficiently accomplished by assisting Canadian users to access existing polar information systems in other countries. CPIS will be fortunate to obtain the funding necessary to cover Canadian-produced information thoroughly, and is unlikely to have the resources to, by itself, cover information produced in other countries. Access to non-Canadian information systems could be provided by online connection, or, more likely, through joint products such as a single international polar CD-ROM.

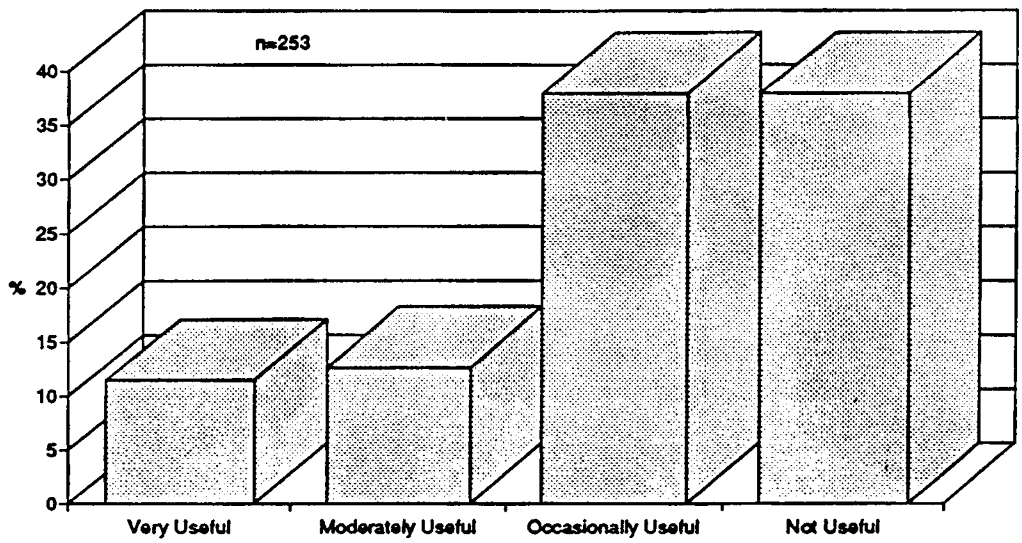
Usefulness of Information About the Antarctic

As shown in Figure 8, there is much less interest in antarctic information among potential CPIS users than there is in arctic information. Nevertheless, a significant number of users would make at least occasional use of antarctic information if it were available. Providing access to polar information systems in other countries will automatically provide Canadians with access to antarctic information, since two of the major non-Canadian polar databases cover information from both poles. CPIS should not provide original coverage of antarctic information unless the amount of antarctic research being undertaken in Canada increases significantly.

Proportion of Needed Information That Is Polar Information

As the managers of Canada's two major existing polar information systems we have always been conscious of the fact that even a comprehensive polar information system (which ours certainly are not) would provide only part of the information that our users require. Most users also require non-polar information, usually from subject-oriented

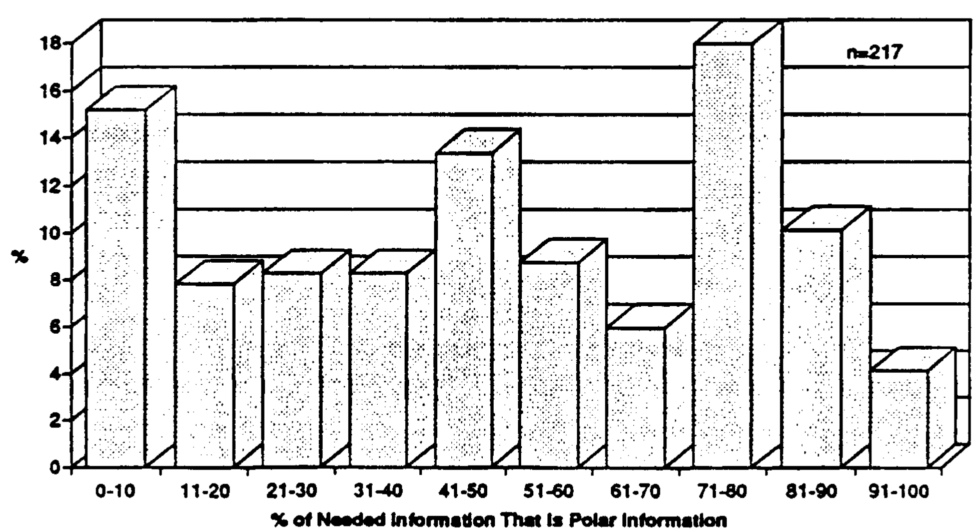
Figure 8 - Usefulness of Information About the Antarctic



information systems. In the absence of any measurements we have usually assumed that most of our users get the majority of their information from the big subject-oriented databases, and that our geographically-oriented databases play a supplementary role.

The survey results show, however, that if existing Canadian polar information systems play a supplementary role in providing their users with information, this may only be because existing systems are not comprehensive enough. As shown in Figure 9, a

Figure 9 - Proportion of Needed Information That Is Polar Information



significant number of potential users expect that a comprehensive polar information system would fulfill a large percentage of their information needs. To put it another way, we expected that the bars on the left of this graph would be higher than those on the right, but in fact the graph is relatively flat. (This, and the other histogram-type graphs in this report, are not smooth curves because of the tendency for people to pick "round" numbers, such as, in this case, 50, 75 and 90.) Even allowing for the fact that this survey was targeted at persons with a high level of interest in the polar regions, we were surprised at the large number of respondents who expected that they could meet over 70% of their total information needs from a comprehensive polar information system.

What Types of Information Should CPIS Contain?

Desired Information Types

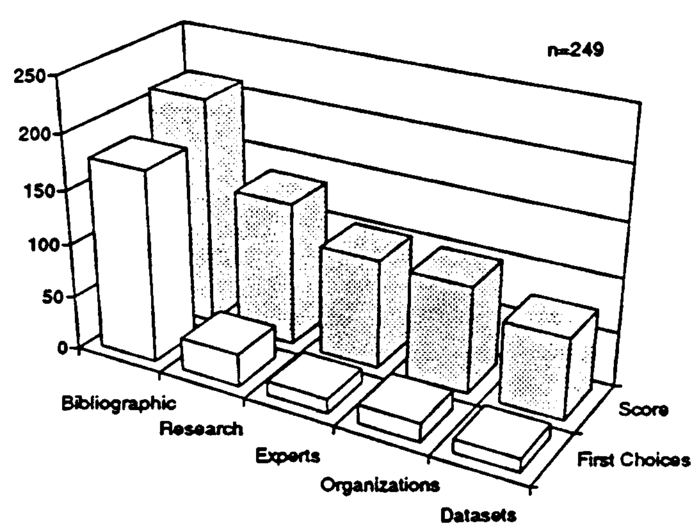
Survey respondents were asked to rank five information types according to their expected usefulness to CPIS users:

- Bibliographic citations
- Research project descriptions
- Listings of Canadian polar experts
- Listings of Canadian organizations with polar expertise
- Descriptions of significant Canadian polar numeric datasets

Respondents numbered the information types from 1 to 5, with 1 meaning the most useful and 5 the least useful. Each number from 1 to 5 was used once and only once.

The results are shown in Figure 10. The front row of the graph shows the number of times that each information type was selected as a respondent's first choice; that is, the number of times that it was assigned the number 1. The rear row of the graph shows a

Figure 10 - Desired Information Types



combined score for each information type, and information types are arranged on the graph from left to right in decreasing order of this score. The combined score for an information type was calculated by multiplying by four the number of times that it was assigned the number 1, by three the number of times that it was assigned the number 2, etc.; then summing these numbers for each information type; and then multiplying the resulting five numbers by an arbitrary scaling factor so they could be plotted on the same graph as the number of first choices. The two rows of the graph should, and do, generally agree with each other, but the "Score" row is the more reliable measure of the overall usefulness of an information type.

The number of information types to be included in CPIS will be determined by the amount of funding available and the expected cost of providing adequate coverage of each information type. Everything else being equal however, information types should be considered for inclusion in CPIS in the order that they appear in Figure 10.

Other Suggested Information Types

Respondents were also asked to suggest additional information types that should be considered for inclusion in CPIS. 43 respondents did so, but many of the suggestions were for document types or subject areas that will be, or could be, included in CPIS under its bibliographic information type. Suggestions for new information types included listings for conferences, courses, museum collections, funding sources, field stations, photographs, a geographic information system (GIS) and an electronic bulletin board. A GIS has been explicitly ruled out as part of CPIS, since it would be more appropriately operated by the agencies that are responsible for land management in northern Canada. Electronic bulletin boards are available to polar researchers from other sources. Some of the other suggestions, however, will be considered for inclusion in CPIS if funding allows.

What Time Period Should CPIS Cover?

Desired Retrospective Literature Coverage

Survey respondents were asked to indicate how many years of retrospective literature coverage were important to them. The results are shown in Figure 11. About half of the respondents want more than 20 years of retrospective coverage. We conclude that CPIS should provide as much retrospective coverage as it can afford, but realize that it will be difficult to even fill the gap since the end of *Arctic Bibliography*'s coverage in 1971.

Desired Retention Period For Research Project Descriptions

Respondents were asked to indicate how many years research project descriptions should stay in CPIS after the projects that they describe are completed. The results are shown in Figure 12. About half of the respondents think that research project descriptions should stay for more than 20 years, with 37.3% thinking that they should stay forever. We conclude that a relatively long retention period is desirable, provided that we make it easy for searchers of the database to exclude old research projects from their searches. We do not expect that the cost of leaving such records in the database will be significant, but this cost should be monitored closely.

Figure 11 - Desired Retrospective Literature Coverage

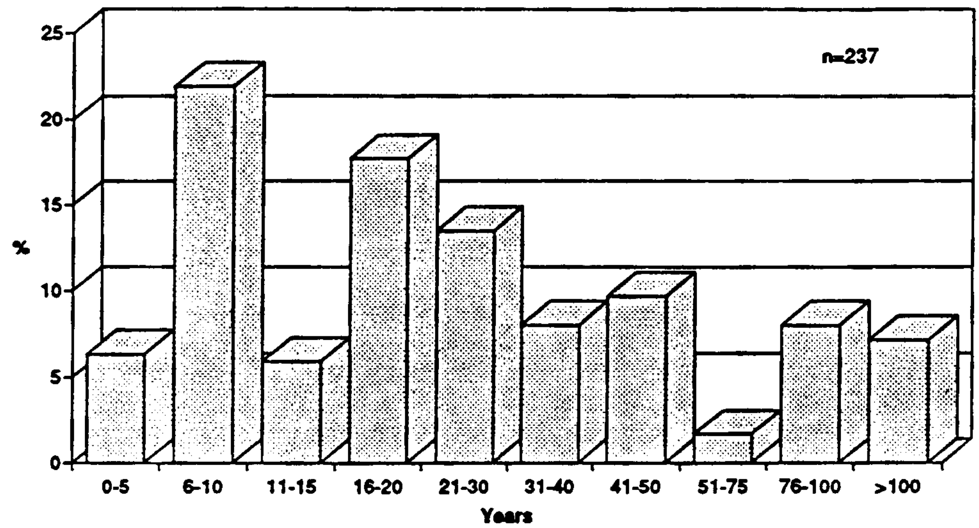
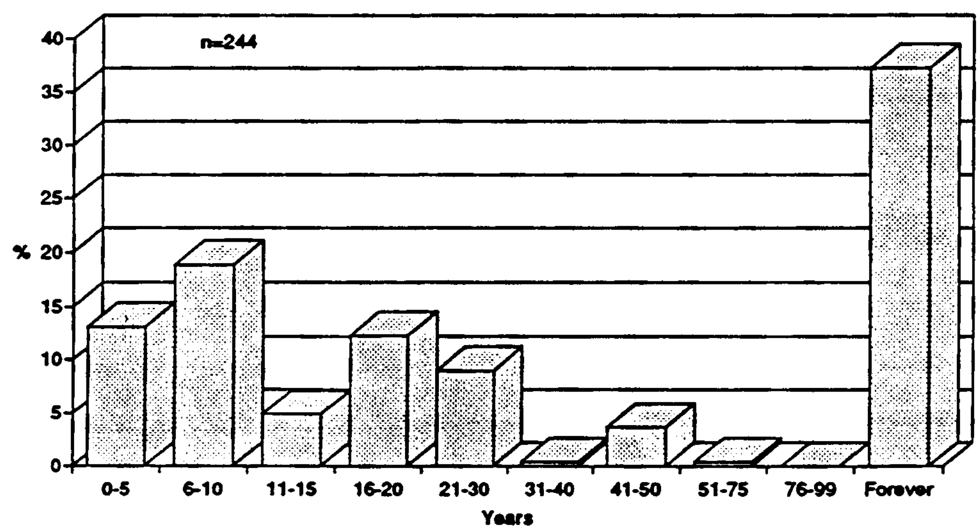


Figure 12 - Desired Retention Period For Research Project Descriptions



What Products and Services Should CPIS Provide?

Desired Products and Services

Survey respondents were asked to rank nine products and services according to their expected usefulness to CPIS users:

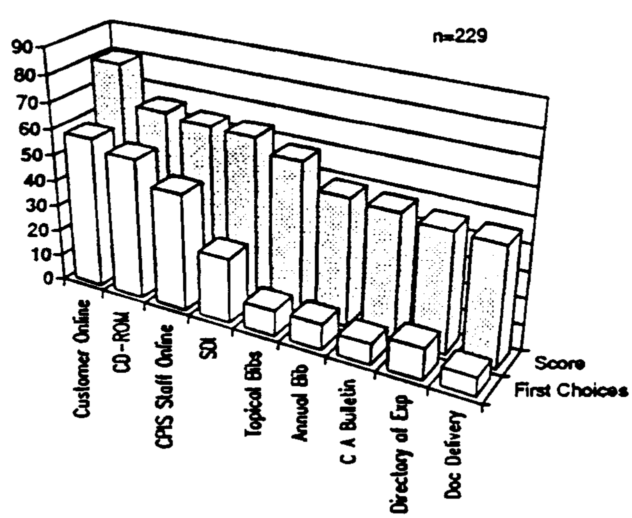
- Online searches performed by the customer
- A CD-ROM containing the entire CPIS database, updated every six months

- Online searches performed by CPIS staff
- A selective dissemination of information (SDI) service, sending customers newly-added records in just those subject or geographic areas of interest to them
- Topical bibliographies on subjects or geographic areas of current interest
- An annual printed bibliography containing bibliographic, research project and dataset records added to CPIS during that year
- A monthly current awareness bulletin listing all records added to CPIS during that month
- An annual directory of Canadian polar expertise, containing all experts and organizations currently listed in CPIS
- A document delivery service for all items described in CPIS bibliographic records

(The survey questionnaire, included in the final report of the study (Goodwin and Minion, 1991), described the products and services in more detail than the above list does.) The respondents were told to assume that the products and services were very comprehensive, containing at least 90% of the information within CPIS' stated area of geographic and chronological coverage, and that all records contained abstracts. Respondents numbered the products and services from 1 to 9, with 1 meaning the most useful and 9 the least useful. Each number from 1 to 9 was used once and only once.

The results are shown in Figure 13. The front row of the graph shows the number of times that each product or service was selected as a respondent's first choice; that is, the number of times that it was assigned the number 1. The rear row of the graph shows a combined score for each product or service, and products and services are arranged on the graph from left to right in decreasing order of this score. The combined score for a product or service was calculated in the same manner as described earlier for information types. The two rows of the graph should, and do, generally agree with each other, but the "Score" row is the more reliable measure of the overall usefulness of a product or service.

Figure 13 - Desired Products and Services



The information in Figure 13 is not, by itself, sufficient to determine which products and services CPIS will provide. It must first be determined how much each product or service will cost to produce, and how much of this cost will be "subsidized" by sources of CPIS revenue other than customers' payments for the product or service. Then customers' pricing expectations, as described in the next section of this report, must be taken into account. Are there enough potential users who are willing to pay a reasonable price for the product or service? The respondents who ranked a product highly may have done so because they expected that its price would be low. By how much do we multiply the market demand in our survey sample to get an estimate of total demand, given that this is not a random sample of a population of known size? While the ranking shown in Figure 13 is not the complete answer to the question of what products and services CPIS should provide, it is an important part of that answer.

Pricing of Products and Services

Figures 14 through 17 show how much respondents would be willing to pay for the four most-desired CPIS products and services. Similar graphs for the other five products and services are given in the final report on the study (Goodwin and Minion, 1991). The first column in each graph is the percentage of respondents who indicated that they would not require the product or service no matter how low the price. This column was included on the graphs because it conveys information about the amount of "disinterest" in the product or service.

As mentioned previously, prices for CPIS products and services cannot be set by simply choosing the average (or median) prices from these graphs. Instead, the graphs will be used to estimate how many people would be willing to pay a "reasonable" price for a product or service, and therefore whether that product or service would be worth producing.

Figure 14 - Price for Online Search by Customer

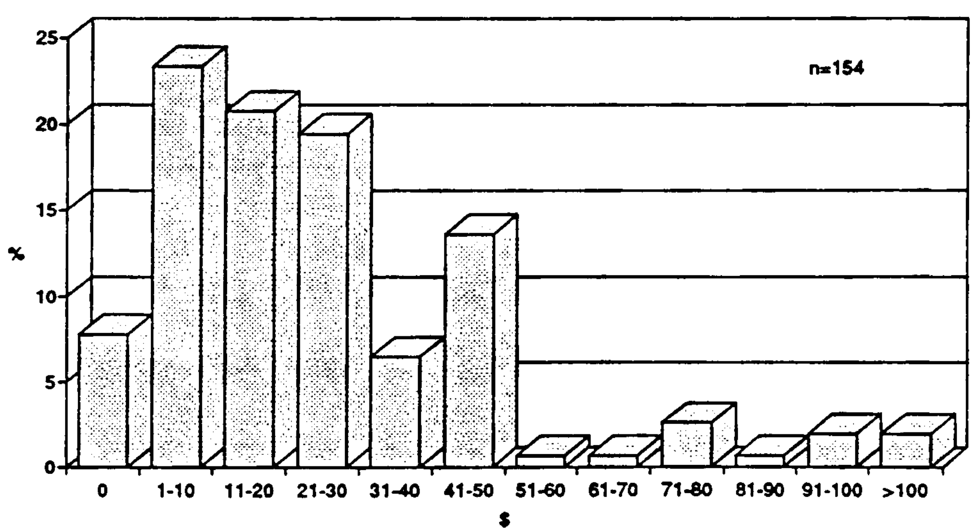


Figure 15 - Price for CD-ROM Subscription

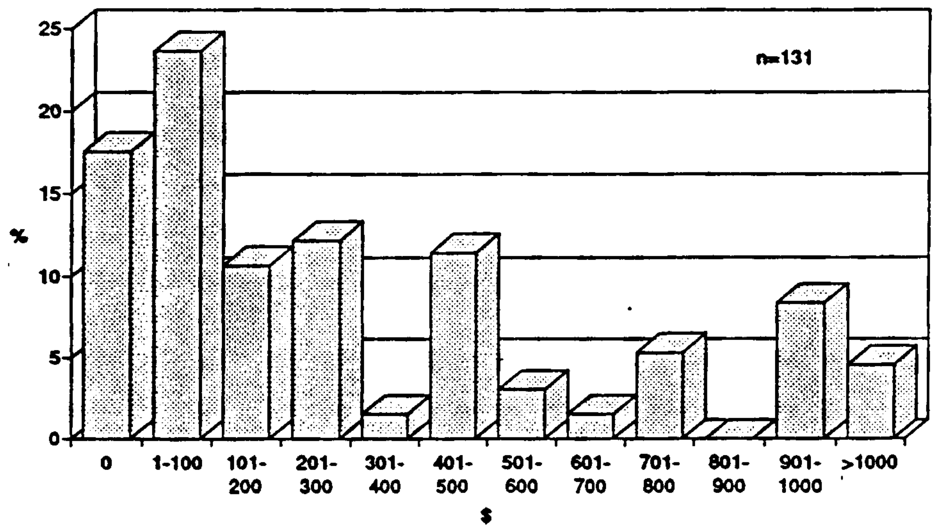
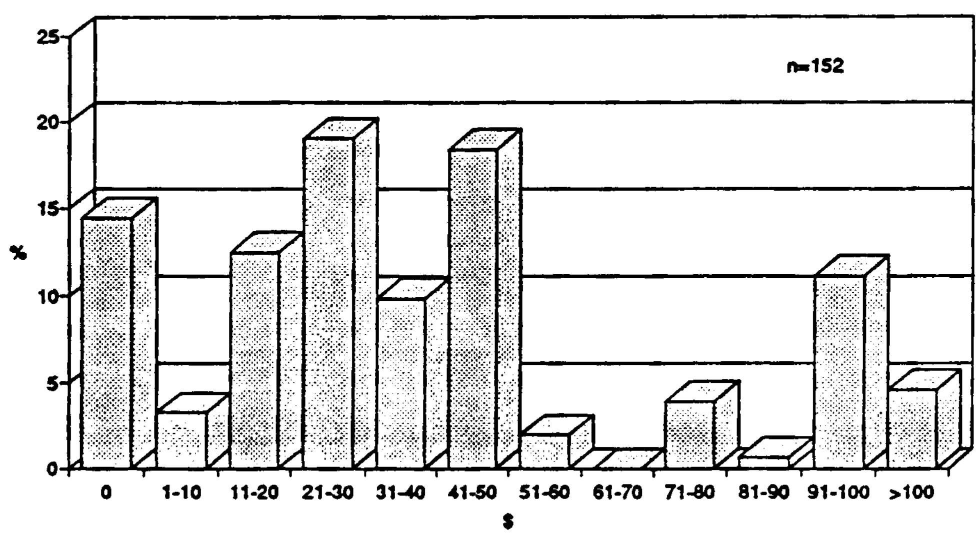
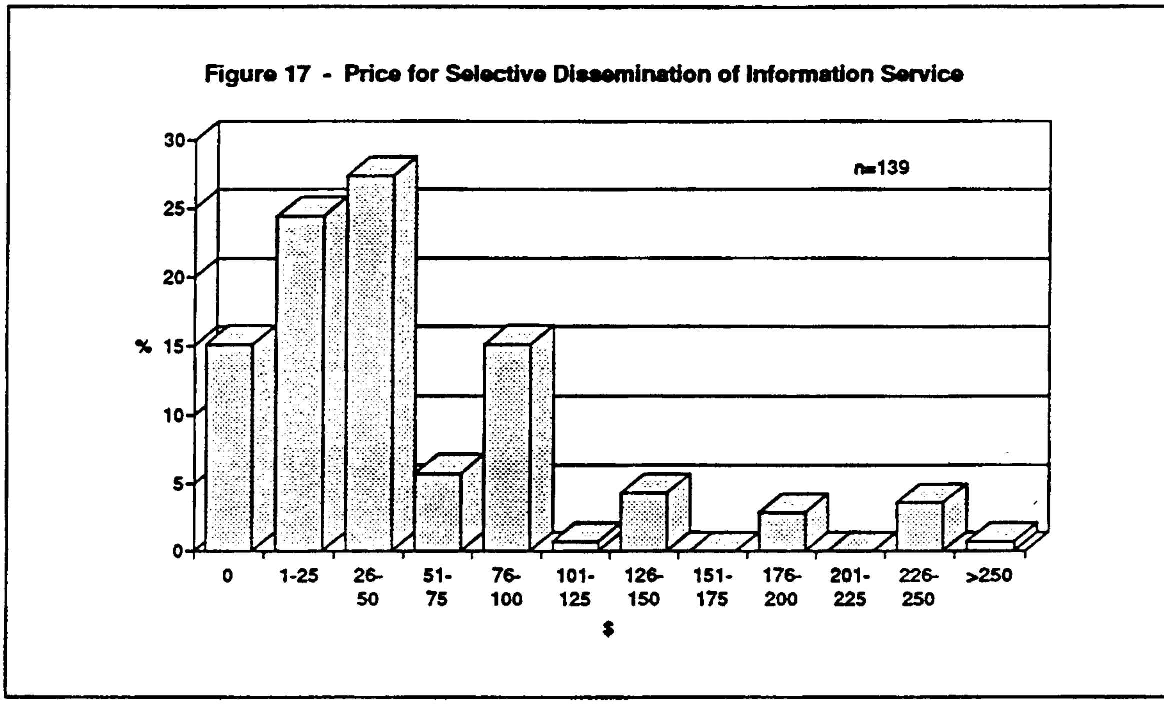


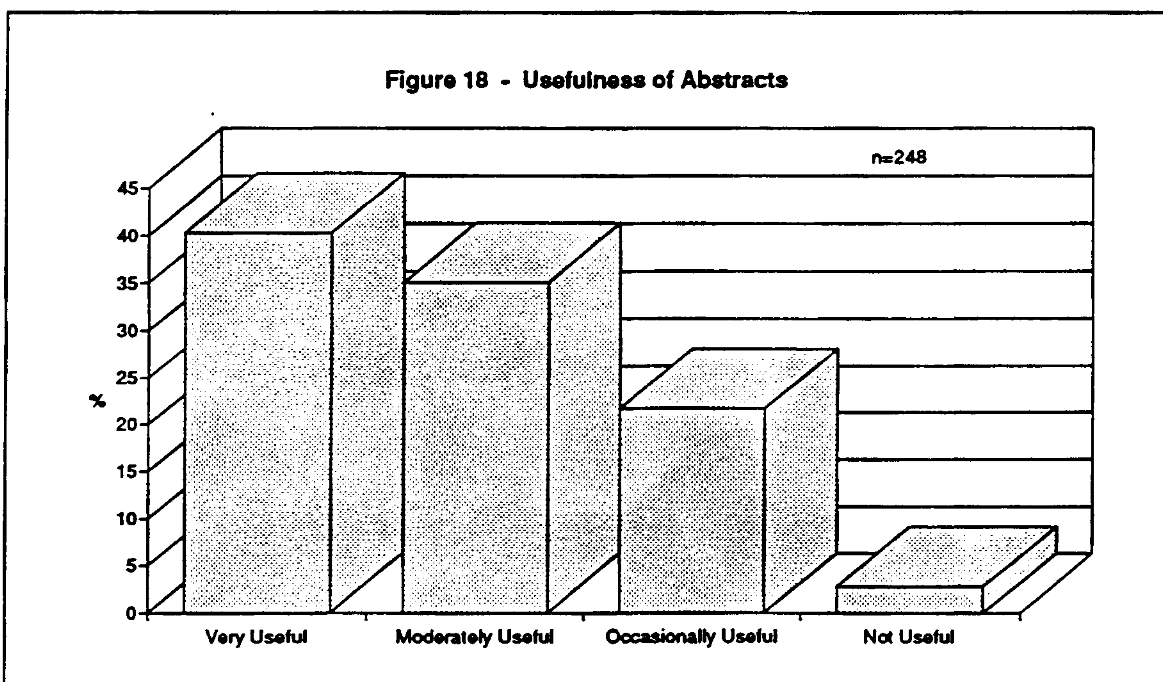
Figure 16 - Price for Online Search by CPIS Staff





Usefulness of Abstracts

Respondents were asked how useful abstracts would be in CPIS products and services. The results are shown in Figure 18. There is very strong support for the inclusion of abstracts in CPIS. We conclude that abstracts that can be obtained just for the cost of keying, such as author-supplied abstracts and abstracts extracted from a document's summary or conclusions, should be included in CPIS. The costs of writing original



abstracts for bibliographic records must be evaluated carefully, as must the costs of obtaining or preparing abstracts for each non-bibliographic record type. CPIS should not have a rigid policy that all records must contain abstracts, but it should be possible to cost-effectively provide abstracts for a majority of the records in the system, given the clear user demand for this information.

Other Suggested Products and Services

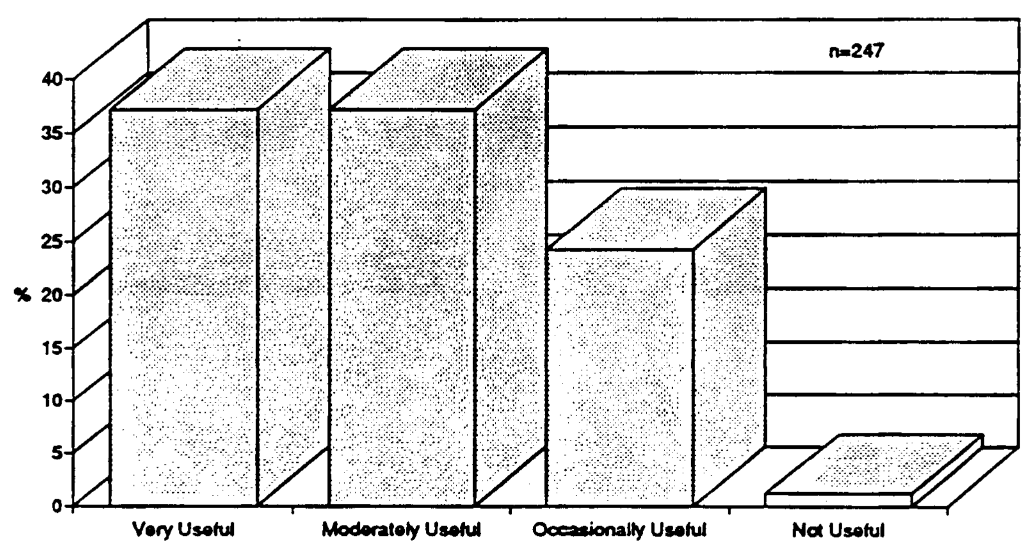
Respondents were asked to suggest additional products and services that they would like to see CPIS provide. 23 respondents replied to this question, but some responses were suggestions for coverage of particular subjects, or comments on some of the listed products and services. New products and services suggested included custom data synthesis, periodic reviews of newly-added knowledge in the major subject areas and low-cost school versions of some CPIS products and services.

General Questions

Usefulness of CPIS

Respondents were asked how useful CPIS would be to them or to their organization, assuming that most of the suggestions that they had made in the rest of the questionnaire were followed. The results, shown in Figure 19, indicate a high level of support for CPIS. There is no significant north-south variation in this support, with 75.8% of Yukon and N.W.T. respondents indicating that CPIS would be very or moderately useful, compared to 73.7% for all other regions combined.

Figure 19 - Usefulness of CPIS



Other Suggestions

Respondents were asked if they had any other suggestions for the design of CPIS. 64 respondents provided suggestions. The most frequently repeated suggestion, made by 8 people, was that CPIS should include, or provide access to, information from other circumpolar countries. This opinion also came across strongly in two of the earlier questions. 6 people mentioned that CPIS should build on established centres of excellence and not duplicate existing services. 3 people suggested that CPIS should have production or dissemination centres in the Yukon or N.W.T. 3 people suggested a particular online vendor, CAN/OLE, for making the CPIS database publicly available within Canada. There were many comments about pricing, including several strongly-worded requests that CPIS products and services be free. Many of the comments are quoted in the final report on the study (Goodwin and Minion, 1991).

Conclusions

We are pleased with the amount and quality of information that this survey of potential CPIS users provided. The response rate from our mailing list of potential users was very good, and the amount of time and thought that respondents put into answering a very detailed questionnaire was laudable. As with the other CPIS background studies, having a group of participating specialists review the study methodology and final report was valuable.

From a representative sample of 257 potential Canadian polar information users we learned that:

- there is a high level of support for CPIS
- users' priorities for CPIS information types, from highest to lowest, are: bibliographic citations, research project descriptions, listings of Canadian polar experts, listings of Canadian organizations with polar expertise, and descriptions of significant Canadian polar numeric datasets. Several additional information types were suggested.
- users' priorities for CPIS products and services, from highest to lowest, are: online searches by users, a CD-ROM, online searches by CPIS staff, a selective dissemination of information service, topical bibliographies, an annual printed bibliography, a monthly current awareness bulletin, an annual directory of Canadian polar expertise, and a document delivery service. Information was also collected on users' price expectations for these products and services.
- CPIS should use the southern limit of discontinuous permafrost as the southern border of its Canadian coverage
- CPIS should provide access to northern information from other circumpolar countries
- CPIS should make the provision of information about the Antarctic a low priority
- CPIS should give a high priority to the inclusion of abstracts
- CPIS should provide as much retrospective coverage of bibliographic information as funding allows
- CPIS should use a relatively long retention period for research project descriptions

Acknowledgements

The success of this study can be directly attributed to the amount of time and thought that was given to the survey questionnaire by the 257 respondents. Their willingness to share their thoughts with us was, in itself, an indication of the high level of support for a CPIS. Our sincere thanks to all them.

The authors also wish to thank the following participating specialists for their advice and assistance during the study: Serge Allard (Library, University of Quebec at Abitibi-Témiscamingue), Susan Baer (N.W.T. Court Library), Diane Chisholm (Yukon Libraries and Archives), Audrey Conroy (Newfoundland Regional Library, Fisheries and Oceans), Sue Hanley and Ramma Kamra (Departmental Library, Indian and Northern Affairs), Carolynn Kobelka (Northern Heritage Centre Library), Françoise Lange (Library, University of Quebec at Chicoutimi), Cameron Macdonald (Canada Institute for Scientific and Technical Information), Eileen Murdoch (Nunatta Campus Library, Arctic College), Dan Pauli (Library, Esso Resources Canada), Marianne Scott (National Library of Canada), Jean-Jacques Simard (Groupe d'études inuit et circumpolaires, Laval University), Marianne Stenbaek (Centre for Northern Studies and Research, McGill University), Rob Sutherland (Learning Resource Centre, Yukon College), Judith Whittick (C-CORE, Memorial University) and Louise Wuorinen (Northern and Regional Studies Library, Lakehead University).

Thanks to Elaine Maloney-Gignac of the Canadian Circumpolar Institute for translation of reports and correspondence during the study. We would especially like to thank Harald Finkler of the Circumpolar and Scientific Affairs Directorate for his encouragement, and for his Directorate's support of our CPIS efforts during the years prior to the creation of the Canadian Polar Commission.

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ARE YOUR ROOTS IN HAPARANDA, SWEDEN? THE ORIGINS AND USE OF DEMOGRAPHIC INDIVIDUAL-BASED DATA ON DIFFERENT LEVELS

Tapio Salo
Chief Librarian
Haparanda, Stadsbibliotek

Introduction

For Swedish people interested in their roots the Swedish Church Archives are a unique and exhaustive source. The Church of Jesus Christ of Latter-Days Saints has copied the church archives in Sweden on microfilm. It donated the copies of these films to the Swedish National Archives, which in return made copies for the county libraries in Sweden. Thus it became possible for the general public to research their family history.

With the addition of the Demographic Data Base and SVAR (Swedish Archives Information), it has become easier to get structured information on family and local history.

Church Registers

The Lutheran Church had, as most churches, the parishioners under tight control. People lived in the fear of God and the clergyman punished members if they didn't obey. In the Lutheran church people were obliged to learn the basic documents of the church and clergymen examined their knowledge.

The church archives in Sweden are well preserved and in good order because Sweden has lived in peace the last 180 years and the church archives were always kept in fireproof chests. Other countries have had registers too, for example the ancient Romans registered people for statistics and taxes, punishment and for ranking people according to their civil rights (the people in occupied areas only had duties!). The first Christian parishes in the 3rd century registered baptisms, marriages, and deaths. When the Christian faith became a state religion all the citizens in Rome were regarded as Christians and the registration ended.

During the Middle Ages the registration started again. The earliest church records are from Italy and date from 1305. The Council of Trident in 1563 decided that church registers should be kept.

The Genealogical Research in Sweden

Commonly, Swedish amateur studies are conducted in study circles. People who are interested in their family history organize themselves in one of the 12 different national study federations and start a circle. They can study at moderate cost and have their teacher or lecturers in special fields paid by the federation.

Without the microfilm or microfiche it would be almost impossible for an amateur historian to make research in church archives, because the original source materials are kept in Provincial Archives. The nearest archives to Haparanda can be found in Härnösand, at a distance of 600 km. It would be expensive and time consuming to travel to these archives.

During the years 1948-1963 the Church of Jesus Christ of Latter-Days Saints microfilmed about 100 million pages from the Swedish church registers. They donated one copy of these 61,000 microfilm rolls to the Swedish National Archives. One copy was placed in every County Library for further loans to local public libraries. The master films are stored by the Mormon Church in Salt Lake City in their Genealogical Society Library.

For example, the Haparanda public library has microfilms on church registers from its own parishes. Many public libraries in Sweden have special rooms for genealogical studies. They are equipped with microfilm and microfiche readers, and lately with copying equipment for microfiche. Before SVAR started this project converting microfilm to microfiche, libraries had a lot of work with ordering and handling of microfilm reels at quite high cost.

Information to be Found in Swedish Church Registers

The Church law of 1686 stipulated that the Lutheran clergymen should keep regular records on their parishioners. The medieval clergymen made only economic documentation but in the 17th century the church leaders understood the importance of accurate record keeping not only for the purpose of taxation.

The Major Church Registers

<u>The Parish Catechetical Examination Register</u>: recorded families in farms, villages and quarters. Through the house examination the ministers tested the people's ability to read and their knowledge of religion.

The examinations took place once a year. In this register we can find, for example, new members of families, marriages, deaths, migrations and the names of the individuals living on the farm. We can also find their professions, birthdates and birthplace, their reading ability and comprehension, and knowledge of Religion. These abilities were described with special codes which can be deciphered with a key included in the record. You can also find notes if individuals had been vaccinated, if they were poor, blind, lame, had been punished or owned a Bible.

The Migration Register: gives information in chronological order of all the individuals who moved in or out of the parish. Sometimes the clergymen made notes on whether a person was an upstanding citizen.

The Register of Births and Baptisms: a chronological register of individuals who were born and baptized in the parish. When a child was born outside marriage it was characterized as an illegitimate child.

The Register of Published Banns and Contracted Marriages: registered banns and/or marriages in chronological order. The brides parish recorded the names of the couple, their ages and the date of marriage.

The Records of Deaths and Burials: registered in chronological order all the people who died and/or were buried in the parish. You can find also the name, home place, date for burial, date for death and the profession of the dead. Sometimes you can find the cause of death and obituaries.

These sources are used by professional historians and people who are interested in their roots or in the history of their village or town. The Demographers at the universities were interested in this rich, high quality material and were looking into possibilities to link this information into a more structured data base. At the University of Umeå the possibility to use these registers in computerized form was developed. This was the beginning of the Demographic Data Base which was located in Haparanda.

Haparanda

Since 1809 the border between Sweden and Finland has been Torneå river with Haparanda and Torneå on opposite sides. Haparanda town was established in 1842 by the Swedish King Karl XIV Johan, and had about 200 inhabitants that year.

This year Haparanda celebrates its 150th anniversary.

When Sweden lost Finland to Russia in 1809 Haparanda was only a village with 8 houses. Sweden was obliged to build up a new town for the trade across the new border, and for the administration of the river valley on the Swedish side.

Through the community reform in 1967 three small communities: Haparanda, Nedertorneå and Karl Gustav formed a new community with the name Haparanda. It has about 10,500 inhabitants today.

Demographic Database in Haparanda

Nedertorneå/Haparanda parish was one of seven parishes chosen by the University of Umeå together with The National Archives and Swedish Employment Authorities for a project to register church archives for later use in demographic research. This project started in 1973.

Haparanda was chosen by scientists for its genealogical patterns; the Torne River valley is interesting for researchers in political, social, economic and cultural point of view. The high unemployment rate in Haparanda because of the Finnish monetary devaluation in 1967 was one of the main reasons for locating the Demographic Data Base in Haparanda.

In Haparanda a big majority of the population is employed in trade and after the monetary devaluation in Finland many female workers lost their jobs. DDB gave employment to about fifty of these women.

The three main purposes for the establishment of DDB were research, archiving and employment. When Demographic Database in 1978 became a permanent unit within Umeå University it had the following aims:

- to register and process mainly demographic and social historical data for research and for educational and archival purposes,

- to make this data easily accessible to researchers,

- to strive for scientific co-operation and contribute to methods development within the areas where Data Base material can be used.

Each of the communities within the project were chosen for their special qualifications: TUNA, project of reading traditions in the church and teaching of people, FLENINGE and TROSA, living conditions of poor and agrarian people, SVINNEGARN, land workers and large land properties, GULLHOLMEN, proposed by ethnologists and architects, and LOCKNEVI, proposed by "culture-geographers."

Later three larger regions were taken into the project for examining migration across parish borders. These regions were also chosen because of their special qualifications. The regions were SUNDSVALL (extensive industrialization, large population increase, high degree of social and geographical mobility), SKELLEFTEÅ (medico-genetic project) and later LINKÖPING (traditional Swedish culture district).

There are similar data bases for example in Ann Arbor, USA, in Tromsö and Bergen in Norway. But the unique Swedish sources has made it possible to build up a special integrated system for the masses of data.

The gathering of material has been done according to the researchers' interests and priorities. To start with, they chose 19th century material in the seven parishes named above. The church registers in the Database allow reconstruction of life histories of individuals and families. It is also possible to make registers in census-type, i.e. register population at one given point of time for the years 1860, 62, 63, etc. The researchers can make biographies for the persons found in this material. Each note in the base can be identified. You can also choose and reconstruct and create new biographies.

There are two separate main file systems: source file system and event file system. In the source file every single variable can be identified in the form they had in the church registers. Adapted data of individuals are registered in the event file. You can find demographic events and the status of individuals in many aspects and at different dates.

It was not possible to computerize all the church archives in the country because reading of archives is manual work. It would have taken hundreds of years. The present selection has given plenty of source materials for researchers to work with. It makes possible longitudinal individual-based, family-based and structural cross-sectional studies of many types.

This church information can be integrated into other individual-based material like poll tax registers, school records, health records, company records, etc. The Swedish population statistics have been computerized at the parish level. They contain summaries of the individual-based data from the Church records at short time intervals.

A lot of research has been carried out using Database material: the development of literacy, the infant mortality decline, maternal mortality, and death due to tuberculosis, living conditions, migration of elderly people, etc. For example, in 1986 the database was used for many purposes: life biographies for soldiers and peasants, life biographies for handicapped, population in the villages every tenth year, all the individuals in Locknevi who had a relation to some other person living at the same settlement at the same time, all the craftsmen in parishes born before 1830.

Groups other than researchers can use the material, for example societies for genealogical research. The Database can also provide family investigations for genealogical research and for the general public.

Access to the Material

Material in these databases is internationally accessible to the researchers. A basic requirement is that the researchers contact the Demographic Database at the University of Umeå. It is possible to create special programming according to the researchers' individual needs.

There are interactive programs which are available for direct communication in the Population Database - POPUM. There are in total about 365,000 individual, or roughly 1,644,000 entries. The researchers can use the INDIKO interactive program. Data can be displayed in graphic form. You can list reading marks, comprehension ability, kinships, etc.

The resulting data files can be obtained on floppy disks or tapes according to user's specifications. The general public interested in their roots probably would not find their own specific family history on line from the database. As mentioned before, only 7 parishes and 3 regions of about 2500 parishes were selected for the database. The Demographic Database in Jörn will do research on your family history for a small charge. Trained personnel search not only the database but also microfiche containing all the church registers.

Social, Economic and Educational Benefits of Locating the Demographic Database in Haparanda

The benefits on employment have been mentioned before. Another important advantage is the introduction of new technology and know-how to a small community. Together with the Technical College in Luleå, the Database in Haparanda has developed CD-ROM for Skellefteå parishes including Demographic data from the year 1720 to 1900 in Skellefteå.

The production of CD-ROM led to development and education for teachers and students. A foundation was started by some persons earlier employed at the Database. The community of Haparanda was one of the owners. The foundation grew bigger and discovered new uses. Later the foundation was changed into a private company which today works on the commercial field and produces specialized and practical data for private enterprises. It also deals with the sale and service of computers.

The contacts with the University of Umeå created new possibilities for distance education at the university level. For example, basic education in law and business economics can be had in Haparanda.

The Database has been involved with education at different levels. One of the primary aims was to present the materials in the database, particularly to schools. A special project for the public schools began in Haparanda. The first task was to educate teachers. The project was partly financed by the Haparanda community. The important part of the project was to use computers in teaching.

The Database has also arranged numerous conferences and courses for participants from the entire country.

In 1991 the population registration in Sweden was transferred from the Lutheran Church to the taxation authorities. In Haparanda, a company was established when two people from the Database began to transfer the church registers to the taxation authorities. This is a big reform which definitely ends the church's role in modern registration of the population in Sweden. The company has eight people employed today and is working with many kinds of registration.

The local public library has benefitted greatly from the database in Haparanda. Amateur researchers require less help now from the personnel in the library. The library built a small local history collection held in the Haparanda Room on the premise of the Database. The library has also placed a valuable photo collection in the same building. We have a vision to link these photos to the demographic database system!

Together with the county library and SVAR the Haparanda Public Library has arranged a course for library staff in genealogical research.

The library and the database form a common resource which has been a big help for the local genealogical and other historical research.

SVAR Swedish Archives Information -
Flexible Help for Ordinary People Seeking Their Roots

The general public has sought their roots aided by microfilm produced primarily by the Church of Jesus Christ of Latter-Days Saints. Nowadays these materials are available on microfiche for the whole country through SVAR, which was established in the year 1978 in Ramsele.

In the 70's the loan of microfilm increased and there was a long waiting period. Therefore SVAR was established and became the loan center instead of county libraries. One of the main reasons for locating SVAR in the small town of Ramsele was unemployment as in the case of Haparanda. Nowadays SVAR has decentralized its work to 5 districts. SVAR is organized under the Swedish National Archives.

SVAR's task is to safeguard archival material of vital interest, and to make archival material available to researchers, libraries, archives and educational institutions through the sale of microfiche. The main task for SVAR has been to convert 35 mm microfilm to microfiche.

The Swedish church records contain approximately 700,000 microfiche. About 90 people work at SVAR during the winter season. Researchers can borrow microfiche from SVAR through their university libraries or local public libraries or visit Ramsele. For a charge, SVAR personnel can serve individuals.

Since the late 80's, every public library in Sweden has had an agreement with SVAR. In 1991 approximately 232,000 packets of microfiche were sent out from SVAR to researchers all over Sweden, as well as to Finland, Norway and Denmark. A fee is charged for this service.

There are many other records besides church registers available from SVAR: records from the Royal Military Archives, documents as tax records from 1571 and 1613, census records from 1860 to 1920, genealogical collections, maps, etc.

Several indexes to microfilmed material are available. An agreement between SVAR and the Swenson Swedish Immigration Research Center in Rock Island, Illinois, USA has made SVAR's microfiche available in North America.

Because of the celebration in 1988 of New Sweden, which was a former Swedish settlement in North America, a number of documents regarding the former colony are available. Most of the material concerning emigration is to be found in the House of Immigrants in Växsjö.

One of the biggest customers of SVAR is the Genealogical Center for Scandinavia of the Mormon Church.

Do You Really Have Your Roots in Haparanda?

In the case you think you have your roots in Haparanda and that your ancestors lived there, then you are in luck. You can get your genealogical chart quickly with the help of the staff at the Demographic Database in Haparanda or in Jörn, for a fee.

You have to order a form from the Database and fill in the information about your ancestors' birth, birth place and parish. You have to take into account that the clergymen who wrote the books could have been drunk or mad when he made his notes. Fortunately, the pertinent information can be verified in many different church registers.

If you think you have your roots in some other parish you can go about it in the same way. Most of the local researchers want to make these investigations themselves and complete these sources with other materials about the surrounding society by reading local history, discussing with relatives, etc. This investigation process is for many of the amateur researchers, especially for retired people, the most stimulating part.

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"The Valley of Sagas." 1990. In Sweden & America, Winter.

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I SUPPOSE YOU HAVEN'T GOT THIS, BUT ... SOME THOUGHTS ON BUILDING UP A GLACIOLOGICAL COLLECTION

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Abstract

Recommendations are made on the acquisition of publications to serve the needs of a glaciological research group, whose requirements may change and evolve over a period of years. The selection is made on the basis of over 25 years' experience as Manager of the WDC-C for Glaciology at the Scott Polar Research Institute, and from the examination of reference lists and bibliographies found in specialized periodicals encompassing the English, French, German, Italian, Scandinavian, Soviet, and some oriental languages.

Twenty-five years ago last June, I took up my present post as Manager of World Data Centre 'C' for Glaciology in Cambridge. Among other duties, I am responsible for maintaining the collection of glaciological publications held by the Scott Polar Research Institute. (The glaciological collections of the WDC and of SPRI were amalgamated many years ago, to save space and to avoid unnecessary duplication). This activity forms the background to my talk, and, although I shall be discussing a very specialized area of interest, I hope that my approach will have some value to anyone who aims to build up a similarly sized collection.

I think that half the requests I receive, whether by letter, by telephone, or by a personal call, are prefixed by the words "I suppose you haven't got this, but ...", and, of course, we usually do have it or can locate its whereabouts.

This negative approach probably stems from the very wide range of subjects sheltering under the umbrella of the term "glaciology". What is glaciology? In my view, it is not just the study of glaciers, nor even just of ice and glaciers, although the Oxford English Dictionary defines it as that (and adds that the word was used first in 1892). After 100 years, I think that it is due for redefinition. At WDC-C, we now regard glaciology as the science of ice in all its forms in the widest possible sense. All the articles, books, reports, everything that I catalogue, may be placed in one of twelve categories (Table 1). Having said that, there is, in fact, a thirteenth category for those very general works which may embrace several categories, and that is, of course, "General glaciology".

While thinking about the requirements for building up a collection of glaciological literature, I was diverted into wondering how many times I had classified into the twelve groups since we began feeding the SPRILIB database in 1985. This calculation is illustrated by a histogram (Figure 1). From this, it can be seen that nearly a quarter of the whole is devoted to floating ice (which includes freshwater ice as well as sea ice). Slightly fewer entries are devoted to land ice. Of all these topics, the only one about which I have not yet been asked is "glacioastronomy".

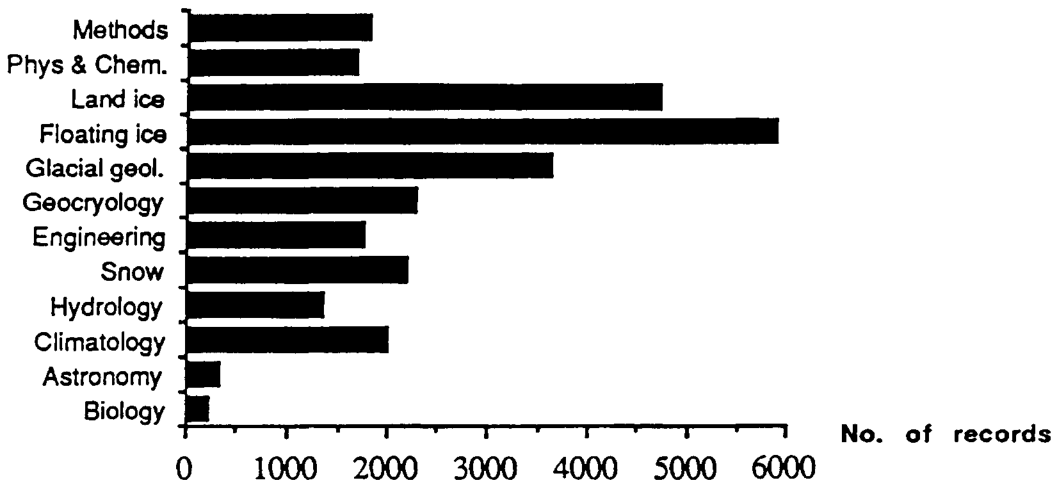

Figure 1. Number of records by subject area.

To explore this further, I then carried out a small citation study, based on an analysis of authors' reference lists. I took six recent issues from each of five journals that are popular with the glaciological community (*Cold Regions Science and Technology*, *Geografiska Annaler*, *Journal of Glaciology*, *Permafrost and Periglacial Processes*, and *Zeitschrift für Gletscherkunde und Glazialgeologie*) and selected the first two papers in each journal, making a total of twelve articles from each journal. I broke down the reference lists of these articles into six categories: books, articles in journals, articles in conference proceedings, reports and theses. I followed the same procedure with twelve articles from an International Association of Scientific Hydrology conference proceedings on snow hydrology, another twelve from an Offshore Mechanics and Arctic Engineering conference proceedings and twelve from an issue of the *Annals of Glaciology* (these are always conference proceedings). Lastly, I analyzed eight pages of references from Paterson's classic *Physics of Glaciers*. Table 2 summarizes this study.

Not unexpectedly, journals and articles in conference proceedings are the most widely used sources of information. It was interesting to find that 30 to 40% of citations in conference proceedings were directed to other conference proceedings, whether in the same or a different series. It is also not unexpected that the *Journal of Glaciology* leads the field for journal citations. Another strong contestant is the *Journal of Geophysical Research*. Other rather random observations include the lack, until recently, of a suitable home for articles on geocryology, which has now been rectified by the new journal *Permafrost and Periglacial Processes*; however, this has not yet made an impact on authors' references.

For books, Paterson's *Physics of Glaciers* is an easy winner; this is quoted in many lists appended to articles on every branch of glaciology, and must be regarded as the glaciologist's bible. For reports, the CRREL series of Reports, Special Reports and Monographs figure prominently in reference lists, and are, incidentally, one of the most requested items in the SPRI library.

So we come to specific recommendations for a glaciological collection. An analysis of these reference lists shows some clear leaders, so although the outright purchase of sufficient publications to build a library could be a daunting proposition from scratch, demanding generous funding, it should be possible to supply around two-thirds of common requirements for a small but quite comprehensive glaciological collection from a relatively modest selection.

For books, the absolute essential is the afore-mentioned Paterson's *Physics of Glaciers*. After this, it is necessary to assess the particular requirements of the institute or individuals at whom the collection is aimed, and also whether basic textbooks as well as advanced research manuals will be required. At present, a list of the most used books on the glaciological shelves of the SPRI library includes those listed in Table 3, at the end of which I have appended two classics that should also find a place in the collection.

Moving on to journals, Table 4(a) lists those of primary glaciological interest, and Table 4(b) shows some useful "regional" journals, which deal with aspects of glaciology in specific parts of the world (not always polar, even in the widest sense). They are often in the language of the country of publication, being intended largely for glaciologists in that country; however, a summary in English is often provided. Their acquisition would depend on the interests of a particular library. These recommendations call for little comment, except to note that the *Journal of Geophysical Research* has not been included because it consists of several sections covering various geophysical applications, with papers of glaciological interest appearing in different sections, according to their basic interest (for example, marine sciences for articles on sea ice or atmospheric studies for articles on snowflakes). Acquisition would be expensive, and it would be a relatively simple matter to refer to any particular issue as the journal is found in many large libraries. The same comment applies to *Nature* and *Science*. Certainly, these three last-named periodicals should be scanned regularly.

Then we come to conference proceedings, which can easily consume a large part of any budget, as this is how conferences cover some of their costs. My advice would be to buy only those which were of particular interest to regular current users, remembering that many of the papers presented will be of passing interest only, or, if of lasting value, will probably be expanded and published elsewhere. Conference proceedings may form a regular series or appear as a "one-off" publication, standing by itself as a book, or, quite frequently nowadays, appearing as a "special issue" of an existing journal. Some examples of regular, or numbered, series (annual or biennial conferences, or, anyway, fairly frequent) are listed in Table 5.

Keeping track of the proceedings of the many important "one-off" conferences is a problem, as they are not very good at advertising themselves. They may appear in a convenient book form, with mention of the conference in the preface only, or they may appear as a special issue of a journal. Books will surface from publishers' catalogues, and recent useful examples appear in Table 6. (I have deliberately kept these examples very general; there are further important conferences dealing with particular regions such as the Antarctic or the Arctic). Special issues of journals are rather a problem. Generally, these can only be located from regular scanning of *Current Contents* or by word-of-mouth. We have learned to be aware of special issues appearing in such journals as *Nordic Hydrology*, *IEEE Transactions*, and *Marine Geology* ... it is difficult to be specific here.

Under the heading of reports, I have already mentioned the CREEL series of reports; these are essential, and so too, of course, are the *Glaciological Data Reports* from WDC-A for Glaciology in Boulder. Most institutions issue reports of value to those working in their particular field; a letter of enquiry will often bring forth a deluge of information. I have had rewarding experiences with the UK Meteorology Office, the Canadian Department of Transportation, and the Max-Planck-Institut für Meteorologie, to name but a few, and many are free of charge.

Finally, we come to those publications that can be grouped under the heading of "miscellaneous". I have listed a few of these items in Table 7. They include reference works such as encyclopedias, digests, atlases, gazetteers, and dictionaries or glossaries. We all have our favourite dictionaries and atlases. I find that I refer frequently to a geological dictionary such as the American Geological Institute's *Glossary of Geology*, to a glossary of permafrost terms (the National Research Council of Canada have produced a useful one) and to the Scott Polar Research Institute's *Illustrated Glossary of Snow and Ice*. I should also mention the recent *Elsevier's Dictionary of Glaciology*, compiled by Kotlyakov and Smolyarova, which is a brave attempt to provide the English, French and German equivalents for Russian terms.

This "miscellaneous" group also includes sea-ice charts, climate statistics, and glacier statistics. The sea-ice charts of northern and southern ice limits, produced by the US Naval Polar Oceanography Centre, Suitland, Maryland, are frequently in demand at WDC-C, also the World Glacier Monitoring Service's *Fluctuations of Glaciers*, which appears every five years and tells you all you would ever want to know about the movements of selected glaciers, worldwide. Coupled to this is the Monitoring Service's *World Glacier Inventory, Status 1988* (published in 1989), which is a valuable source of reference. These items are listed in Table 7.

Then there are bibliographies and, particularly useful, the accession lists of other libraries, so that you know what you should have and do not! Here, there is the CRREL monthly *Current Accessions List*, which is cumulated annually as the *Bibliography on Cold Regions Science and Technology*. We find this especially useful for Russian articles. Naturally, I must commend the Scott Polar Research Institute's own *Polar and Glaciological Abstracts*, which includes many of the entries to be found in the monthly WDC-C publication, *Glaciological Citations*.

I have suggested some basic material for any new glaciological collection. I am aware of some omissions, but, as I stated previously, I have aimed at providing two-thirds of the essentials, basing this partly on the range of references cited by authors in glaciological articles and partly on my own experience in the management of WDC-C.

Table 1 - Sub-divisions of glaciology

Glaciological instruments and methods
Physics of ice
Land ice
Floating ice
Glacial geology and ice ages
Frost action and permafrost
Glacio-meteorology and glacio-climatology
Snow and avalanches
Glaciohydrology
Frozen ground/snow and ice engineering
Astronomical aspects of ice
Biological aspects of ice and snow
General glaciology

Table 2 - Percentages of sources cited in selected glaciological publications

Books	9.0%
Articles in books	5.0%
Articles in journals	58.5%
Articles in conference proceedings	17.5%
Reports	8.0%
Theses	2.0%

Table 3 - Some books for a glaciological collection

Bradley, R.S. Quaternary paleoclimatology; methods of paleoclimatic reconstruction. (Allen and Unwin, 1985)

Colbeck, S.C. (ed.) Dynamics of snow and ice masses. (Academic Press, 1980)

Drewry, D.J. Glacial geological processes. (Arnold, 1986)

Gray, D.M. and Male, D.H. (eds.) Handbook of snow. (Pergamon, 1981)

Grove, J. The Little Ice Age. (Methuen, 1988)

Gurnell, A.M. and Clark, M.J. (eds.) Glaciofluvial sediment transfer: an alpine perspective. (Wiley, 1987)

John, B.S. The ice age, past and present. (Collins, 1977)

Lliboutry, L.A. Very slow flows of solids: basics of modeling in geodynamics and glaciology. (M. Nijhoff, 1987)

Molnia, B.F. (ed.) Glacial-marine sedimentation. (Plenum, 1983)

Paterson, W.S.B. They physics of glaciers. (Pergamon, 1969; 2nd ed. 1981; new edition due soon.)

Table 3 - Some books for a glaciological collection (continued)

Phukan, A. Frozen ground engineering. (Prentice-Hall, 1985)

Sugden, D.E. and John, B.S. Glaciers and landscape: a geomorphological approach. (Arnold, 1976)

Ulaby, F.T., Moore, R.K., and Fung, A.K. Microwave remote sensing: active and passive. (Addison-Wesley, 1982)

Untersteiner, N. The geophysics of sea ice. (Plenum, 1986)

Williams, P.J. and Smith, M.W. The frozen Earth.

Agassiz, L. Studies on glaciers (first published in 1840, and translated and edited by A.V. Carozzi in 1967, published by Hafner)

Wright, C.S. and Priestly, R.E. Glaciology. British Terra Nova Antarctic Expedition (1910-1912). (Harrison, 1922).

Table 4 (a) - Primary glaciological journals

Cold Regions Science and Technology (USA)

Bulletin of Glacier Research (Japan)

Geografiska Annaler (Sweden)

Glacier Mass Balance Bulletin (Switzerland)

Journal of Glaciology (UK)

Low Temperature Science (Japan)

Permafrost and Periglacial Processes (UK)

Zeitschrift für Gletscherkunde und Glazialgeologie (Austria)

Table 4 (b) - "Regional" glaciological journals

Biuletyn Peryglacjalny (Poland)

Geografia Fisica e Dinamica Quaternaria (Italy)

Geographie Physique et Quaternaire (Canada)

Jökull (Iceland)

Journal of Glaciology and Geocryology (China)

Materialy Glyatsiologicheskikh Issledovaniy (Russia)

Neiges et Avalanches (France)

Neve e Valanghe (Italy)

Seppyo (Japan)

Table 5 - Conference proceedings of interest to glaciologists

Annals of Glaciology (UK)
Cold Regions Engineering, conference proceedings (USA)
Eastern Snow Conference, proceedings
Ground Freezing, proceedings of International Symposium
IAHR (International Association for Hydraulic Research), proceedings (secretariat in the Netherlands)
IASH (International Association of Scientific Hydrology), proceedings of relevant numbers (secretariat in UK, USA)
Ice Technology, International Conference, proceedings (UK)
OMAE (Offshore Mechanics and Arctic Engineering), conference proceedings (Vol. 4: ice technology (USA)
Permafrost, International Conference, proceedings
POAC (Port and Ocean Engineering under Arctic Conditions), International Conference
Western Snow Conference, proceedings

Table 6 - "One-off" conference proceedings, issued in book form

Bradley, R.S. and Jones, P.D. (eds.) Climate since A.D. 1500. (Routledge, 1992)

Davies, T.D., Tranter, M., and Jones, H.G. (eds.) Seasonal snowpacks: processes of compositional change. (Springer-Verlag, 1991)

Jones, H.G. and Orville-Thomas, W.J. (eds.) Seasonal snowcovers: physics, chemistry, hydrology. (Reidel, 1987)

Oeschger, H. and Langway, C.C., Jr. (eds.) The environmental record in glaciers and ice sheets. (Wiley, 1989)

Oerlemans, J. (ed.) Glacier fluctuations and climactic change. (Kluwer, 1989)

Sabadini, R., Lambeck, K. and Boschi, E. (eds.) Glacial isostasy, sea-level and mantle rheology. (Kluwer, 1991)

Table 7 - Miscellaneous reference material

Gary, M., McAfee, R., Jr. and Wolf, C.L. (eds.) Glossary of geology. (American Geological Institute, 1972)

Harris, S.A. and others. (comps.) Glossary of permafrost and related ground-ice terms. National Research Council of Canada. Associate Committee on Geotechnical Research. Technical Memorandum 142 (1988)

Armstrong, T.E., Roberts, B.B., and Swithinbank, C.W.M. Illustrated glossary of snow and ice. (Scott Polar Research Institute. Special Publication No. 4, 2nd ed. 1973)

Kotlyakov, V.M. and Smolyarova, N.A. (comps.) Elsevier's dictionary of glaciology in four languages: English (with definitions), Russian (with definitions), French and German. (Elsevier 1990)

Sea ice charts of northern and southern ice limits (US Naval Polar Oceanography Center, Suitland, MD)

Fluctuations of glaciers (World Glacier Monitoring Service, Zürich)
(also World Glacier Inventory, status 1988)

Acknowledgements

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INFORMATION ACQUISITION AND USE BY ANTARCTIC SCIENTISTS: A STUDY CONDUCTED AT THE BRITISH ANTARCTIC SURVEY

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Abstract

A survey of British Antarctic Survey scientists was conducted to assess the relative importance to them of various information sources - e.g. BAS and other libraries, current awareness journals, the *Arctic and Antarctic Regions* CD-ROM, on-line searches, and personal communications from other scientists. Also investigated, by means of a citation study, was the relative importance of Antarctic and non-Antarctic literature in Antarctic research. The implications of the findings for library service provision to Antarctic scientists are discussed.

Introduction

The aim of this study was to investigate the use of primary literature and secondary information sources by Antarctic scientists and to assess whether the findings could suggest improvements in the library and information services provided to them.

Since the information sources section of this study was limited to scientists working for the British Antarctic Survey, some background information on the Survey is presented here. BAS employs c. 180 scientists, just over half of whom were in the Antarctic at the time the survey was conducted - these were necessarily excluded from the study. The research programme covers a wide range of natural sciences - geology, geophysics, glaciology, meteorology, climatology, upper atmospheric physics, and terrestrial, freshwater and marine life sciences. BAS library is small considering the range of subjects covered but the Survey's scientists have access to the extensive library resources of Cambridge University.

Methods

1. For the information acquisition section of the study a questionnaire was sent in January 1992 to the 88 scientists who were, at that time, in Cambridge asking their attitude to and sources of current awareness and their preferred sources for retrospective searches. 75 questionnaires were returned, an 85.2% response rate.

2. The information use section of the study was conducted by means of a citation analysis of a small sample of the Antarctic literature - a) all papers published in *Antarctic Science* vols. 1 & 2, 1989-1990 and b) papers published by BAS scientists in 1990. This was aimed to assess the relative importance of Antarctic and non-Antarctic literature to Antarctic scientists and also to assess the relative importance of the different types of literature - i.e. journal papers, conference proceedings, books, theses and grey literature.

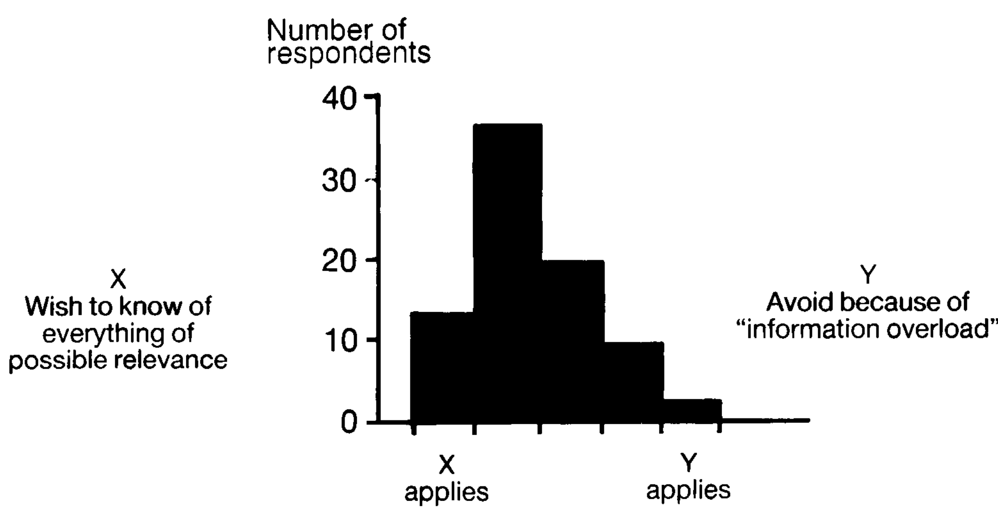
Results

1. The questionnaire

a) Current awareness

Respondents were asked to indicate their attitude to current awareness on a 5-point scale ranging from "Wish to know everything of possible relevance" at one extreme to "Avoid because of information overload" at the other. Results are shown in Fig. 1.

Fig. 1: Attitude to current awareness



Despite this healthy enthusiasm for current awareness, many scientists made comments such as "too much literature, too little time" in response to a question asking what if any difficulties they encountered in keeping up-to-date with the literature.

Next respondents were asked to rank the following sources of current awareness on a scale of 1-8: BAS Library current journals, other libraries' current journals, *Current Contents* (paper ed.), *Current Contents* (diskette ed.), *Current Antarctic Literature*, SPRILIST (current awareness from the SPRI Library database), other abstracting and indexing journals and other sources. Full analysis of the results proved impossible as many respondents either ranked several options equally or ranked only a few as they did not use the rest. Rankings for respondents' first three highest preferences only are shown in Table 1.

Table 1. Preferred sources for current awareness

	Preference (%)		
	First	Second	Third
BAS Libraries	69	21	7
Other libraries	9	33	19
Current Cont. (paper)	6	4	19
Current Cont. (disk)	3	2	8
Cur. Antarct. Lit.	5	9	10
Other abstracting js.	5	8	13
SPRILIST	0	4	0
Other sources**	3	19	16

**mainly personal communications from other scientists

The results show a strong preference for browsing through journals themselves to using current awareness journals, even if this means visiting other libraries (and even though many respondents commented on the inconvenience of having to visit other libraries on a regular basis). Several respondents commented that often journal articles selected from current awareness sources because of a promising title, in fact turn out to be irrelevant. No doubt this would be true of all disciplines, not just Antarctic studies. One geologist commented that he had no difficulty in maintaining awareness of the Antarctic literature but did encounter problems in keeping up-to-date with other geological literature relevant to his work. This illustrates the need for Antarctic libraries to stock as wide a range of journals as possible.

b) Retrospective searching

Respondents were asked to rank the following on a scale of 1-7 as information sources for retrospective literature searches: BAS Library catalogues and stock, *Arctic and Antarctic Regions* CD-ROM, their personal bibliographic database/card indexes, on-line searches of external databases, abstracting and indexing journals, other libraries and other sources. Again, many respondents ranked only some options so rankings for only the first four preferences are shown in Table 2.

Table 2. Preferred sources for retrospective searching

	Preference (%)			
	First	Second	Third	Fourth
BAS Lib.	23	30	22	15
CD-ROM	10	10	12	9
Personal database	48	19	11	5
On-line searches	8	3	9	12
Abstr. js.	0	10	12	15
Other libs.	4	17	28	24
Other sources**	7	11	6	20

**various, but one commonly quoted was to identity a recent relevant review paper and work back from there

Table 2 shows that nearly half of the respondents ranked their own bibliographic database or card indexes as their first source for retrospective searches so they must be fairly confident that their routine information acquisition procedures are identifying all they might need. However, I suspect that they should not in fact rely so heavily on their own databases as those who have used, say the CD-ROM, have commented how often a search has revealed useful, previously unknown, references. This underlines the need for librarians actively to promote new information sources so that their users gain maximum benefit from the library's resources.

The low rankings given to on-line searches of external databases requires some comment. I am sure these would be higher if we had on-line search facilities on site instead of their being available only through the University Library. Therefore the findings should not be taken as typical of all Antarctic libraries.

2. The Citation Study

This part of the investigation looked at the references cited in all papers published in *Antarctic Science* vol. 1&2, 1989-90 (2252 citations) and in papers published by BAS scientists in 1990 (3754 citations). One subject area, upper atmospheric sciences, had to be excluded from the study, partly because it was often impossible to tell from the title of a cited paper whether or not the research had been carried out in Antarctica and partly because two of the main journals in the field (*Journal of Atmospheric and Terrestrial Physics* and *Planetary and Space Science*) do not include article titles in their references.

Each paper cited was allocated to one of eleven categories of publication type:

A Antarctic articles published in Antarctic or bi-polar journals

B Antarctic articles in other journals

C non-Antarctic journal articles

D Antarctic papers in Antarctic or bi-polar conference proceedings

E Antarctic papers in other conference proceedings

F non-Antarctic conference papers

G Antarctic books or chapters therein

H Antarctic chapters in non-Antarctic books

I non-Antarctic books or chapters within books

J Theses, report literature etc. on Antarctic subjects

K Theses, etc. on non-Antarctic subjects

Table 3. Citation analysis by publication type

Category**	No. of citations	% of total
A	1099	18.3
B	1683	28.0
C	1623	27.0
D	360	6.0
E	121	2.0
F	73	1.3
G	253	4.2
H	107	1.8
I	541	9.0
J	123	2.0
K	23	0.4
TOTAL	6006	100.00

** see above for explanation of category codes

Of the 6006 citations, 2260 or 37.6% are to non-Antarctic literature (i.e. categories C, F, I & K). 30.6% of the total (categories A, D, G & J) are Antarctic papers in Antarctic or bipolar sources, the remaining 31.8% (categories B, E and H) being Antarctic papers in non-Antarctic sources.

The dominance of the journal paper as a means of publication is demonstrated. 4405 or 73.3% of total citations are to journal papers, 9.2% to conference literature, 15.1% to monographic literature and 2.4% to other categories.

Of the journal citations 36.8% are to non-Antarctic papers, 25% are to Antarctic papers in Antarctic or bi-polar journals and 38.2% are to Antarctic papers in non-Antarctic sources. 60.5% of the journal papers on Antarctic topics were published in non-Antarctic journals, an unsurprising finding as a previous paper (Thuronyi, 1982) has demonstrated the very scattered nature of the Antarctic serial literature. He found that the 13,665 journal papers indexed for the *Antarctic Bibliography* over an eleven year period were published in 1430 different serial titles.

For monograph citations, non-Antarctic material comprises 60% of the total (authors frequently cited methods texts, such as those on statistics). However, for conference literature, Antarctic citations made up 86.8% of the total, with many citations to papers from the SCAR biology and geology symposia. The majority of citations in categories J and K were to Ph.D and other theses.

As part of the citation study, an attempt was made to identify any inter-disciplinary differences in citation patterns. Each source paper was allocated to a broad subject category: biology, geology and geophysics, atmospheric sciences (excluding the upper atmosphere) and glaciology. Not surprisingly glaciology papers had the smallest proportion of non-Antarctic citations (30.4%) and many of the remainder were Arctic citations. In contrast, 47.2% of the citations in atmospheric sciences papers were to non-Antarctic papers. Both glaciology and atmospheric science papers cited few conference papers (less than 3%). Geologists cited a higher proportion of conference papers (14%) than any other discipline. Beyond this, however, there were no clear inter-disciplinary differences in citation pattern.

Conclusions

Methods of information acquisition used by Antarctic scientists are probably little different from those of scientists working in other areas. Their problems arise from the very scattered nature of the Antarctic literature and from the need to keep abreast of research in their subject area conducted in other parts of the world. A specialist Antarctic library, such as the British Antarctic Survey, cannot hope to take all the potentially relevant journals and a substantial separates collection must be an essential part of the library service. In other countries, such as the United States, the majority of Antarctic scientists are based in University departments rather than in a specialised Antarctic institute. They thus have access to a wide range of journals in their own libraries, but perhaps need help in identifying the Antarctic papers within these journals. Fortunately, current awareness services such as *Current Contents*, on-line databases, and the Library of Congress publication *Current Antarctic Literature* can help them trace the material they need. However, judging by findings of the BAS survey, scientists perhaps need encouragement to use these sources!

The citation study has further demonstrated the wide-ranging information needs of Antarctic scientists: 37.6% of the papers cited were on non-Antarctic subjects. Therefore, to meet the information requirements of Antarctic scientists the librarians serving them must aim to provide a much more comprehensive acquisitions information service than might at first seem necessary.

Reference

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INFORMATION RESOURCES OF THE NORTHERN REGIONS OF RUSSIA: STATUS AND AVAILABILITY PROBLEMS

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Abstract

The information resources of the European regions of Northern Russia contain knowledge and data stored from the year 1216. In recent years 250 scientific organizations and other sources have generated up to 17,000 papers annually. The Kola Bibliography consists of 80,000 citations and more than 20,000 research abstracts. The availability of these information resources for foreign users is low due to bad communication and a language problem. The international cooperation and resource sharing permits the bibliographic data of Northern Russia to be available in a common informational network of the Arctic community.

Introduction

The increase of population and industrial activity in the Polar Zone is a common worldwide tendency. The arising problems concerning a rational utilization of natural resources, a regulation of interaction between Man and Nature, and support of a sustainable environment are common for the Northern community. And it is evident that to make the best decisions and provide a wise management of development the Community must join informational resources of all states.

Information flow and development of the Russian North

The process of occupation of the Northern territories is uneven. The density of inhabitants of Northern America and Scandinavia has not yet reached 2 persons/sq.km., whereas in the European North of Russia the average density of population is 5-10 persons/sq.km. The highest population density in an Arctic area is in the Murmansk region: there are 1.1 million inhabitants within the Polar Circle and the population density in the industrial districts is 20 persons/sq.km.

These records are closely related to a volume of information about the regional natural resource potential which was available for authorities managing the development of the Northern Russia economy. The first evidence of the economic activity of Kola Peninsula is found in from the Russian archives dating back to the thirteenth century (1216 y.). For 700 years scientific investigation at the region was irregular and the minimal information flow did not change the traditional point of view on the Arctic area potential. As a result of that the population was constant and in 1900 was estimated as 7,000 peoples.

Intensive oceanographic research at the end of the nineteenth and beginning of the twentieth century gave information on the presence of non-frozen harbors at the northern coast of Kola Peninsula. That was the reason for the decision to build the railway from St. Petersburg to Kola Bay (1350 km) and establish the Murmansk port during the First World War. The project was realized in 1916 and a new gate to the West opened. The number of inhabitants in the Murmansk region doubled and a patriarchal style of life was predominant while detailed explorations of terrains and the sea basin near the road and the port in the 1920's brought sensational discoveries. The information flow increased six times in comparison to the nineteenth century and about 300 publications on the geology of the Kola Peninsula and bioresources of Barents sea (issued in 1920-1930) had overturned the ancient image of the Russian North. It was shown that the Arctic wilderness hides unique ore deposits under the reindeer pastures and Polar seas contain fish resources richer than the southern seas.

The flood of information provoked an avalanche of investments and an enormous influx of the labour force into the region. At the time, the Western world was paralysed by the "Great Depression." On the Kola Peninsula new towns appeared and new research and information centres were being created.

The last feature should be noted, in particular, since the industrial development of the Kola region is not always correlated with the development of its research and information infrastructure. An alternative version of the Northern exploration is known too: in the region enveloped with "Gold fever," neither Americans, nor Russians cared about the support of informational centres.

Science base and informational resources of the Northern economic region of the Russia

The Kola version of the North exploration, repeated then in the Komi-Pechora region of Russia European North, is distinguished by a special variant which provides as much as possible developed local research-information centres, situated within the developed districts of the Polar land. This type of support resulted in the development of 250 research and designing organizations, which employ over 70,000 people, including 3,250 doctors of sciences, in the Northern economic region of Russia. The Murmansk region maintains the leading position as a research-information centre above the Polar Circle with 20 scientific organizations and 740 scientists - experts having a doctor degree. The largest regional centre of the Russian Academy of Sciences - the Kola Science Centre, comprised of eleven institutes and 4,000 employees is located here.

The flow of information generated annually by the scientific team of the region during recent years is between 1,100-1,500 publications. 400-600 articles per year are added to this number by scientists from institutes of Central Russia and foreign partners. Scientific works are 30-40% of the total number of publications including newspapers and literary magazines.

The Kola Bibliography

Annual bibliographic guides published by the Kola Science Centre Library and the Murmansk Regional Library include 1,868-2,709 citations during 1965-1976, and after 1977 the number of annual publications exceeded 3,000 (maximum number in 1984 - 3,603). On the whole the bibliography guides consist of about 80,000 citations for the period from 1800 until 1990. It had been difficult to complete and synthesize this collection, because information is dispersed in hundreds of magazines and newspapers. For instance, in 1989 the list of magazines included 460 titles and that of newspapers - over 50. Similar (according to its number) information flow is generated in other districts of the Northern economic region. The average annual number of publications here is estimated at 16-17 thousands with about 9,000 being scientific works.

Abstracts of all research papers are published on a regular basis in the All-Russian "Review of Abstracts," issued in Moscow by the Institute of Scientific and Technical Information. The Kola Science Centre collected about 20,000 abstracts and annotations of the Centre staff transactions. The collection of 5,710 abstracts on the geology of the Kola Peninsula, covering the period from 1800 until 1970, was completed and published in seven issues. An analogous unpublished collection of the Polar marine basin had been collected in the Murmansk Marine Biology Institute of the KSC.

Topics of publications include over 30 branches of science and almost all aspects of the development of the social sphere. An analysis of the structure of information fund of 1989 is used here as an example. 1,244 publications (39%) of the total 3,202 (100%) concern social problems, education, culture (1% were articles about libraries). Problems of the regional economy (transport, communications, energetics included) are discussed in 601 publications (19%). A great deal of attention is given to the history of the exploration of the region and to operations of allied armies in Polar regions (319 articles or 10%). Problems of health protection, of saving the traditional ways of housekeeping and cultural heritage of aborigines are analysed in 112 works (3.5%). Various characteristics of the environment (geological structure, geochemistry, meteorology, hydrology, glaciology) are presented in 503 papers (16%), and at that those on geology predominate (292). Biological resources of the region are characterized in 203 papers (6%). A number of publications concerning elaboration of non-waste technologies includes 219 works (7%), of them 139 (4%) concern geotechnologies, 53 (2%) deal with polar marine culture and 28 (1%) concern agriculture. The publications are as varied in their form and style as in themes of publications: from poetry and novels to scientific reports and government decrees.

Availability of the Kola information resources

Is the information generated in the region available to users in and beyond the region? Its not really a problem for the inhabitants of the Murmansk region to get the information. The network of libraries of the region comprises 571 libraries. The total fund exceeds 18 million units. The largest library in the European North of Russia is the Murmansk State Regional Universal Scientific Library, which possesses a fund of 2.3 million units. The fund of the Kola Science Centre library has 490,000 units.

The availability of the regional information fund for outward users, especially for foreign ones, is very low for a number of reasons. Most of the issues of the local publishing house were edited in small quantities and might be classified as typical "gray literature". For example, almost all books of the Kola Science Centre are published in quantities of 300-500 copies, with preprints - up to 150 copies. They are not delivered to book shops but are distributed to subscribers only. The transactions issued by the main publishing house of the Academy of Sciences are published in quantities of 600-700 copies each. Not more than 10% of the information gets to international issues and then mainly as abstracts for presentation at international conferences on geology, geophysics and ecology. The bibliography and book guides are published only in Russian with just 250 copies made available. The bibliography database for computers has just started and is not yet ready for parity exchange with western informational centres. There also is an interlibraries exchange with literature by post within the Community of Independent States, nevertheless filling the orders usually exceeds one month. In 1992, the cost of xerox and photocopies increased 20-30 times compared to the previous year and now the cost of one copy is equal to 0.5% of a monthly budget of a Russian scientist. It is impossible to receive required information via "on line system" or by electronic post.

Involving the Kola Bibliography into international informational network: a first effort and perspective

The attempts to make the situation better are working. In 1992 the Institute of Informatics of the KSC accomplished the necessary tasks and the town of Apatity is now linked to the "Relcom" network of electronic mail and is connected to the international network via Finland. Another active channel of communication is the system "Inmarsat". The shortcoming of both systems is, from the viewpoint of the Russian users, the high cost of communication and that the payment must be done in hard currency when sending messages abroad. Unfortunately, most of the North Russian informational funds do not have any currency.

In 1991 the Kola Science Centre, the Arctic Centre of the Lapland University (Finland) and the Rasmuson Library of the University of Alaska (U.S.A.) signed an agreement of cooperation to establish a common arctic information system which will be based on regular information exchange through telecommunication systems. The Arctic Centre will serve as a bridge between the Kola and Alaska information services. The link will enable telecopy and electronic mail transmission. The first direct call via satellite between the Arctic Centre and the KSC was made on 30 September 1991, and the exchange of e-mail messages began in April 1992. The progress in the development of the communication system is visible now, but the problem of entering the Russian information fund into the PolarPac database is far from a successful solution yet. The first thousand research abstracts produced at the KSC and covering the entire Kola Peninsula and Barents Sea was sent by post to the AC. The Information Service Unit of AC translates abstracts from Russian into English and provides key words. The translated texts are then sent to the Rasmuson Library to be entered into the PolarPac database.

International Resource Sharing - a right way to evolve a Russian knowledge in the Arctic Community storage

The first years experience showed that the time required for the chosen method of loading is too great. Under the present conditions this work would be drawn over many years. In order to enter the Kola collection onto the international database at a more rapid pace than real support from the Arctic community is necessary.

One can see that the situation involving the Kola Bibliography is like that of the Antarctic Bibliography. The 13th Polar Libraries Colloquy approved the resolution for international resource sharing in support of the AB and due to the scope of the AB provided for more rapid input and better coverage of references in languages other than English. It would be useful to provide similar resource sharing in support of a cooperative project "Entering of the Kola Bibliography into the PolarPac". All of the Arctic community would benefit from the availability of a Russian base of knowledge within the international information network.

Conclusion

The informational resources of the Russian North are now open to foreign users. It lacks just a bit of effort and investment in order for the "Russian informational raw-material" to acquire the properties of an "informcommodity", corresponding to the international standards.

REPRINT COLLECTIONS IN THE CULTURE OF SCIENCE

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Abstract

The distribution and collection of scientific papers as "reprints" or "separates" is a behavior which can be traced to the era prior to the creation of scientific journals. It is possible the practice will survive the journal itself as a mode of organizing, disseminating and collecting scientific information. The collection of reprints by individuals and institutions is discussed; the role of such collections in relation to conventional "library" collections is evaluated and possible models for management of a reprint collection are considered.

Introduction

Virtually every science librarian discovers points at which the information-seeking behavior of the scientists we serve abrades our own sense of responsibility as stewards of the literature of science. A common point for this friction is the practice within the culture of science of distributing and collecting "reprints" (or "offprints" or "separates").

I had a personal epiphany with respect to reprints, while still a very new librarian at a marine lab. After offering a collection of agricultural reprints to several faculty and graduate students, I attempted to dispose of the residue -- related to the parasites of domestic swine and poultry -- by placing them in a trash can at the front of the library. I was brought up short by a marine algologist who introduced me, at some length, to the subject of reprints within the culture of science.

"Reprint" is the colloquial term most commonly used to describe this form of scientific literature, but I favor "separate" as the more accurately inclusive term. ("Separate" includes both reprints and offprints from scientific publications, as well as, photocopies -- copyright notwithstanding -- and single issues of serials which are frequently added intact to "reprint" collections.) For purposes of this paper I will follow colloquial usage and use "separate" and "reprint" interchangeably.

A 1986 survey of marine science libraries indicated that 66% of the respondent libraries had "reprint collections" (Heil, 1986). Other surveys have similarly suggested the prevalence of the practice (Robinson, 1986). As librarians, our tendency is to discount the maintenance of collections of separates; they are commonly perceived to be largely redundant (duplicating existing library collections) and hence wasteful of scarce resources. Moreover they are often poorly organized and indexed (which severely limits their potential value as a resource for a diverse user population).

This response is both facile and too simplistic. It does not regard the development of collections of separates as a successful adaption by scientists to the obstacles of delays encountered in seeking to meet information needs (obstacles imposed in no small part by libraries).

A responsible policy for the treatment of reprint collections should respect the legitimacy of such collections (to the degree that they are adaptively efficient) while clearly identifying when such collections become wasteful or inefficient.

Scientific Publication

The scientific paper <u>not</u> the scientific journal, periodical or serial is the fundamental unit of scientific communication. Prior to the publication of the first scientific journal (generally considered to be *Le Journal des Scavans* first published on January 5, 1665) scientific manuscripts were circulated informally within "hidden colleges" (or, as we would say today, "networks") of "natural philosophers" (scientists). (A 1963 estimate suggested that to that point in history, 10,000,000 scientific papers had been published and that the volume of scientific literature was then doubling every 10 years (De Solla Price, 1963)). The journal evolved as a convenient medium for the broader and more democratic dissemination of new scientific information.

The past three centuries have been -- among other things -- the era of the scientific journal. One study estimates an increase in the historic cumulation of scientific journals from 30 worldwide in 1700 to 75,000 in 1970. Another study estimated that in 1962 the number of currently published scientific journals was 35,000 +/- 10% (Houghton, 1975). The success of the journal as a form is thus undeniable and, in direct consequence, the single most common class of problems encountered by scientists working in libraries is the clarification, verification and location of cited papers within the mass of scientific serial literature.

Libraries and Adaptive Fitness

Most scientists encounter this problem from the first time they enter a science library as undergraduate students and often it continues to frustrate them throughout their careers. To their credit, they have <u>not</u> passively acquiesced in being victimized by arcane protocols of publication, cryptic codes of abbreviation and the perversities of classification and arrangement within science libraries. They <u>have</u>, not surprisingly, devised a compensatory mechanism which allows them to reduce their frustration, time and energy spent in libraries; hence, the *personal* "reprint collection" as a subjective information file.

To frame the problem slightly differently, the development of reprint collections and the robustness of the practice is a direct index of the frustration libraries produce in scientists.

To make it plain, a scientist, recognizing that a paper encountered in the scientific literature is of more than passing interest will seek to capture that paper. The capture will at least consist of a mental note but more typically will result in a recorded citation and, depending on the merits of the paper encountered, will often include the actual retention of the paper itself. Nowadays photocopies are often instrumental in the capture but, it is not uncommon -- and here, there is a perceived variance among scientific disciplines[1] -- for the scientist to write directly to the author and request a "reprint". In cases where a relationship exists between the requester and the recipient such reprints are often inscribed and/or signed.

It should, however, be stressed that viewing reprint collections as adaptive to the frustration experienced by scientists in satisfying their sustained needs for scientific literature does not completely account for the phenomenon. Reprints are perhaps the single most important article of exchange within the culture of science and the courtesy exchange of reprints is an important element in the bonding of scientific colleagues and in the establishment of personal lineages of research.

Reprint Collections

Whatever the motive, scientists accumulate collections of separates as a part of a personal working library. Typically, such collections are arranged subjectively, most often by author or by personally designated subject groups (although the recent proliferation of "bibliographic" software designed to index and control bibliographic data is changing this pattern).

Such collections may also accumulate in institutions and/or libraries typically as the result of: 1) exchanges of publications between scientific institutions which often involve sets of "contributions" i.e. collections of separates in bound or unbound form representing the published output of the scientific staff (or supported associated researchers) during a given period; 2) direct donations by active scientists of separates of their publications; or 3) bequests by retired or deceased scientists or by institutions which expire.

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[1] It is my unsubstantiated opinion that there is a direct correlation between the typical cited half-life of the literature within a given scientific field and the robustness of the custom of reprint exchange. Thus, I would expect within the field of biochemistry that reprint exchange is far less robust than in the fields of systematics and taxonomy.

Libraries may chose to maintain such collections for several reasons. Direct access to an adequate library of scientific literature may be constrained by cost or convenience of access.[2] These factors obviously come to bear upon library collections in remote settings such as marine biology laboratories or biological field stations or in developing institutions.

Administrators in a given institution may be attached to such collections.[3] It is common enough that the acquisitive inertia (or executive timidity) of preceding librarians may have failed to clear the library of unnecessary materials. Some institutional archives may chose to hold reprints (most particularly those which are signed by authors or annotated by recipients) for their intrinsic historic value or for their archival evidentiary value in disclosing a noted scientist's research process. These factors singly or acting synergistically may produce large collections of separates which may or may not be justifiable in terms of the larger good of the institution or the scientific community.

It is arguable that in some settings the collection of reprints has become such an intrinsic part of an institution that the best alternative for a librarian is to attempt to shape and control the collection. Wherever possible, institutions that are intent on maintaining such collections -- the MBL Library at Woods Hole is perhaps the best known example of a major library of international repute which has maintained a major collection of separates (Robinson, 1986) -- should be encouraged to use computer based methods of bibliographic control.

It is now commonly suggested that we are on the threshold of the demise of the journal as a form. That electronic publishing, photocopying, facsimile transmission, and sophisticated document delivery systems -- not to mention the development of locally controlled databases and CD-ROM technology will make possible an escape from the constraints of both journals and libraries. In that new brave world "reprint collections" in various forms would supplant libraries all together, but for now, the journal is the dominant organizational and delivery mechanism also providing an editorial device (through the conventions of peer review).

Managing Reprint Collections

A critical issue for librarians is our ability to develop and apply criteria which clearly differentiate those situations in which reprint collections serve a real need (i.e. are

[2] The extent to which inconvenience is a major deterrent to the use of networking arrangements in libraries and hence leads to discouragement or substitute pathways of information-information seeking is worthy of study.

[3] Scientific administrators, like everyone else, may simply have an emotional/sentimental attachment to "reprint collections", but they may also value them as a means of demonstrating the quantity and quality of scientific output for general promotional purposes or specifically for purpose of grant applications or budgetary defenses. (Which is to say, a pound of published research may be worth thousands in research money).

adaptively useful to scientists) and those situations in which they are practically anachronistic and culturally vestigial.

Another way of phrasing the question is: assuming that reprint collections either within the library or within the larger institution have been identified as wasteful of resources which might otherwise be applied to unique and inadequately supported library materials and services, what should the librarian do?

Keys to successfully treating this problem are: 1) having a clear and precise understanding of and accounting for the true costs of library operation and of how costs are directly and indirectly allocated and 2) bringing scientific staff to a full and ongoing awareness of the environment of resource competition in which libraries exist. When scientists are made fully aware of the "trade-off's" involved and librarians make plausible, well reasoned arguments a wasteful course will seldom be pursued. This, of course, suggests that the librarian must involve scientists, in an open and accountable way, in critical areas of library planning and policy making.

Potential methods for accomplishing this goal are: efficient and cost-effective organization, operations and services (i.e. minimizing the difficulties of working through the library to satisfy needs) -- we have made great gains through automated, remote, networked access to bibliographic records; the relentless inculcation in scientists of the true costs of all library materials and services (specifically, the calculation of actual costs per shelf foot of storage); and education about the impacts of inflation on libraries.

Computer-based Management?

An emerging model for managing reprints is the "local holdings" option which is being developed and is now offered as a part of some CD-ROM bibliographic systems. Such a model allows for the processing of existing reprint collections without full data entry on an item level. A full bibliographic database -- for example a bibliography focused on marine molluscs -- can be loaded to a compact disk (or other medium) and then using efficient search software, a given set of reprints can be searched against it and simply "checked-in" if held in the collection. Such a device might also serve as a useful collection development tool.

It follows from the foregoing discussion that reprint collections are an established fact within the sciences and that rather than practice denial or overt resistance, librarians as a profession should respond creatively and gracefully to that reality.

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LIBRARY AND RELATED SERVICES TO NATIVE AMERICAN INMATES IN TWO ALASKAN CORRECTIONAL INSTITUTIONS

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Our approach to this subject has two areas of focus: 1) the conditions of Alaska Native American life and stresses of acculturation to the dominant "non-native American" culture[1], and 2) library and related services for Native Americans who are incarcerated in Alaska. In my view, the second is not fairly considered without careful regard for the first.[2]

For eight months in 1991 I was an inmate at the Yukon-Kuskokwim Correctional Center in Bethel, Alaska, which is located on the Lower Kuskokwim River in a region of wet tundra in west central Alaska. The climate is characterized by strong winters and beautiful but rather short summers. The inmate population averages between 80-100, and is 95% Yupik. It is almost entirely men, with only a handful of women in custody at any one time. These are separately housed. YKCC is a holding or booking facility, and serves as a regional jail for the state-sized Yukon-Kuskokwim delta region, within which are about 50 remote Central Yupik Eskimo villages.

The total delta population is over 20,000. The remote villages are about 95-98% Yupik, whereas Bethel, the regional center, is about 64% Yupik. Bethel's population, about 4000, is one fifth of the region's total. More disturbing are the statistics on the state prison population, supplied by the Alaska Sentencing Commission (1990). Though the percent Native of the state population is almost 16%, the percent Native of the state prison population is almost 45%, or three times greater.

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[1] Defining ethnically the culture and society of the United States is difficult. It is multicultural, but as George Orwell expressed it in *Animal Farm*, ' some animals are more equal than others'. Certain ethnic groups control or predominate in the print and electronic media nationally. Technical resources, expertise, and fiscal and political power are largely held by Euroamericans---"white men" (and women). In any case, from the Native American standpoint, other ethnic groups control their lives far too much.

[2] Native Americans in Alaska as a group are called, both by others and themselves, Alaska Natives, or Natives. I will use these terms, or specific sub-group names. The terms Indian or Athabascan and Eskimo are will known, but in Alaska more precise naming is common: Central Yupik Eskimo, Siberian Yupik, Tlingit, Tanana Indian, etc. Still finer specificity is possible, which usually indicates a village or some other domain, reflecting differences in dialect or other aspects of predominant area ethnicity.

Later in 1991, I was transferred to the Hiland Mountain Correctional Center, which is the main treatment facility for the Alaskan correctional system. It is located just north of Anchorage, and has both sexual offender and habitual offender programs. Its inmate population averages over 200, and about one eighth of these are women, who are housed in a neighboring facility. I have been here over five months, and my release date is June, 1994.

My own library background is that I have an M.L.S. and have worked as a professional for over twelve years in various types of libraries, in both rural and urban locations. In one position I was a librarian for 15 months in a prairie state prison that had Indian inmates, My services were contracted through the state library. In later years I worked mostly in Native communities: for two tribes in the continental United States, and several years in the subarctic Yukon-Kuskokwim delta, homeland of the Central Yupik Eskimos. In the Y-K delta I regularly visited sixteen remote villages over a three year period in a community library development project administered through Kuskokwim Community College, then managed a regional Yupik heritage museum. For the past five years I have pursued research for a book that will be published this year, the subject being "cross-cultural factors affecting library development in Native communities of the circumpolar north".

Once I was incarcerated, I naturally applied to work in the inmate library. As an inmate I have had, needless to say, a unique vantage point to examine and assess library and related services for prisoners, and my special interest is in services for Native inmates. There is a substantial difference between the experience of a staff librarian serving inmates, and an inmate library worker, by the way. An inmate library worker has no authority at all, and has to be careful not to offend any of his fellow inmates. The fact that I am a real librarian "on the street" means little, certainly not to a fellow inmate.

But before going into library services, I should try to describe the psychological and social conditions that Native inmates encounter in the white man's criminal justice and correctional systems. And perhaps more pertinently, we should go further back and look at the communities these men come from, and the kind of lifestyle they are used to at home.

Harold Napoleon, a Yupik Eskimo and formerly a statewide Native leader now in prison, testified recently before the Alaska Sentencing Commission about Native community conditions. Following epidemics 100 years ago that wiped out half the Native population, missionary work and later alcohol proceeded to disrupt and eclipse traditional relationships. Though improvements came much later in education, housing, health care and municipal construction projects, a malaise or sickness now pervades the Alaska Native community. This is characterized by alcoholism and despair, and what he feels are "post traumatic stress disorders" since the epidemics.

Natives in Alaska, and especially in the Central Yupik homeland, are often found still integrated into a subsistence way of life. The resources are primarily fish, sea mammals, and land animals. These are hunted by men and are used for food, clothing, and also income, through limited entry fishing permits, trapping, and craft items that are sold through a variety of enterprising ways. Plant materials for food and crafts are also gathered, mostly by women. But the traditional roles for both men and women, though relatively strong, are steadily changing. The male hunter finds his services less valued, and young women obtain jobs more easily in the small cash economy. The authority of male village elders is diminishing in many communities, and is certainly not what it was before European contact.

Higher education for Natives, after the small and limited local field campuses of the University of Alaska are utilized, must be pursued in the heart of large non-Native institutions located hundreds of miles from the home village. Young women will see more opportunities opening up, more options for their lives than the traditional one of the homebound and subservient Native wife and mother. Professional career ladders in many fields have not found roots in Native communities, and the young Native has mostly white role models to contemplate. And for many young Eskimo men, to go indoors to study and go to school is effeminate. Its a woman's way, staying indoors so much. Many don't know English very well, as most villages are strongly Yupik-speaking. For some, English is a second language. The oral tradition is strong, though English is the official language in dealing with agencies in Bethel and beyond. Not enough provision has been made for bilingual public meetings, or in supporting the Yupik orthography. The local radio/television stations have significant programming in Yupik, however, and these reach most of the villages. Reading is not only an indoor activity, but a solitary one. There is extremely little reading material available in the new Yupik orthography. In any case, traditional attitudes point out that it isn't natural for a man to be alone indoors, reading like teachers and government agents. A visit to the average Yupik home will reveal a television set, but seldom a shelf of books. Television in the remote villages has not been addressed by the region. It simply becomes another addition to the acculturating invasion from outside---direct from Anchorage, New York, Hollywood, Capetown, and Baghdad.

Though the Alaska Native Claims Settlement Act brought Native corporate control to the extensive resources in the lands and waters, such capitalist concepts are new to Native thinking. Jobs and the education and training they require are not readily available. Or if one does go to one of the universities or vocational schools, one is immersed in the white man's culture, which is a lonely, oppressive, and difficult situation for a young Native man or woman, far from the home village. It is the rare individual who will successfully complete such programs. Then one has to go out into the job market, and probably contend with discrimination in its various forms. Alcohol and lately drugs have become more available in the villages, women have gained more equal status, cash jobs are scarce, snogos and other tools and weapons cost cash money, television programs raise expectations and stimulate fantasies, and it seems that white men and even women get all the best paying jobs. To get a good job would mean leaving the home village and the family safety net to "be a pioneer in the city" as a Yupik song-writer expressed it.

There are far too may Alaska Native men in prison, proportional to the population. Wife battering, assaults, child abuse, senseless murders and teen male suicides are at an epidemic level in the Y-K delta and almost all are "alcohol-related". When we enter the criminal justice and correctional systems we are under the total domination of the white man or "Kussaq", a word derived from the Russian "cossacks" and traders who were the first Europeans in western Alaska only 150 years ago. Although almost all of the village police throughout the Y-K delta are Yupik, as are some of the prison guards at YKCC, professional personnel in the prison and courts are non-Native, as are the laws and the concept of imprisonment.

The Yupik men who end up in the Yukon-Kuskokwim Correctional Center find two rooms devoted to the library materials: the inmate library, and the law library. The law library is required by state law (Cleary vs. State of Alaska), and it is up-to-date and appropriate for Alaska prisoners. But the inmate law librarian is almost always either a white or a black man (at least during the time I was there). Eskimo men often need basic orientations to learn what has happened to them in terms of the law, what their legal options are, what the procedures, terminology, and forms mean. Few can afford a private attorney, and the public defenders have heavy caseloads. So it would be useful and fitting to have a bilingual Yupik paralegal volunteer regularly available in the law library. The hours of opening for both libraries are mostly anytime except mealtimes and during the lock down for "count". Normally law volumes are not borrowed by the inmate. Any legal work is done in the library.

The general inmate library at YKCC is in a slightly smaller room originally intended as a classroom. It is now full of shelving units 4 feet high, and started out as a donated collection. But since the local Kuskokwim Consortium Library began offering materials (books), the situation has changed for the better. Reference books, Alaskana and books of Native interest are found in quantity. Funding for this ongoing support comes from an institutional services grant via the State Library, and includes interlibrary loan. Pickup and delivery of ILL books is done by the Institutional Instructor. A set of the Alaska Library Network Resource Directory on microfiche is available to verify titles. It lists holdings of all major Alaskan libraries, including Bethel. After I became an inmate library worker, we weeded out a large quantity of dead donated books and other materials through grant funds made available by the Bethel library and funds from the institutions' own budget. All these upgrading measures were made possible with the arrival of a new Institutional Instructor, who has several years' experience as a principal and teacher in the delta villages. Many books on the Y-K delta, Alaska Natives and Alaska were added, especially illustrated ones, along with more reference books. Regional maps and wildlife posters made the walls more interesting. Videotapes on delta and other Alaskan wildlife were borrowed from the regional U.S. Fish and Wildlife Information Center in Bethel, to be shown on weekends. The Kuskokwim Consortium Library began loaning more videotapes on regional life, culture, and subsistence issues, which are extremely popular.

For these Yupik men are most interested in.....themselves and their home communities. The single most popular item is the regional weekly newspaper, the Tundra Drums, which is now Native-owned. Although interlibrary loan is available through the Bethel library, it is little used. Most of the men spend less than a year at YKCC, though they may return again and again, spending altogether several years there. Books per se are not the most popular kind of library material---unless they are about delta and Alaskan life, wildlife, and Native-related subjects---and the more colored illustrations the better. Magazines and newspapers are of equal interest, followed by 'old west' and adventure fiction, a pattern found in many prisons. Almost forty periodicals are received, and circulate between the library and living units. The collection is organized in a simplified, non-systematic manner, and books on the shelves are not in linear order. The size of the collection is less than 1000 volumes, so this degree of organization is quite adequate. All books have library cards in them and must be checked out, though retrieval is fairly relaxed. The stresses of incarceration have to leave some room for forgiveness.

But library services do not stand alone as information providers. Counseling in education, training and employment is needed, along with community-oriented referrals. Here the local community college and Native non-profit corporation, the Association of Village Council Presidents, could do more as could the for-profit Native Corporation - Calista, whose headquarters is still in Anchorage. Probation Officers and other counselors inside the correctional/criminal justice systems are overworked and have limited resources.

The Hiland Mountain Correctional Center is quite a different library services situation. It is located at the entrance to Eagle River valley, with views upward to snowy ridge lines and mountains to the east, toward glaciers and ice-fields. The vegetation is birch, spruce, and some aspen, and the climate is moderate compared to the Bethel. Here, the population is 225 men. In addition, there is a separate, neighboring facility for 50 women, the Meadow Creek Correctional Center. Native inmates comprise a fraction of the total population, but again their proportion is much higher than in the state's population. The women's side has its own small library, and they also have access to the larger one on the men's side. Some activities are coed, including lunch and supper. Again, except during 'counts', the inmate population freely roams throughout the inmate custody area. Living units are in separate buildings, so one walks outside frequently, and after the first few weeks, civilian clothes are worn. Because this is an intensive treatment program (SOTP), inmates are allowed many personal belongings in their rooms. In the SOTP we have individual rooms that lock, and in my room, for example, a small stereo tape deck and tape collection, art supplies, two potted plants, a view to the south at trees and many birds out my unbarred window, and maps and other graphics on one wall. There are 10 men in my "wing", plus a cat mascot. There is a television monitor in the dayroom of each wing, and broadcast channels of the Anchorage area are available. "Honor" inmates can have a TV or computer in their room. In other words, though the treatment program is demanding of one's time, energy, and emotions, it is possible to maintain a semblance of normal life, if one combines features of a fraternity house, a squad room, and a mental hospital! The long-term majority of the population stays here from one to several years, so its a penal settlement with an urban ambience. There is a "downtown" center with a barber shop, music room, gym, greenhouse, commissary (for snacks and sundries), hobby shop, and library, with extension classes including telecourses available through the University of

Alaska, Anchorage. To a lesser degree such services are available at YKCC in Bethel as well, except for the college courses, music lessons, and a greenhouse. General Educational Diploma (GED) assistance is available at both institutions. At HMCC there is a playing field for sports or to walk around, whereas at YKCC one can only go outside into a large "walkabout" cage for one hour a day if it isn't too cold. Dining at HMCC is at tables-for-four in a relatively pleasant dining room, whereas at YKCC one sits at long tables and it is noisy. Food is served cafeteria style at HMCC, with choices to select from. At YKCC one is simply handed a tray, though there are often "seconds", and subsistence foods are served in season. (I should hasten to add that both the Bethel and Eagle River correctional centers have high, barbed-wire topped, double fences, all areas are fully lighted at night, and elaborate security systems).

The HMCC 'library', a large room with a shed-style ceiling, turns out to be much more than that. It is a busy place during open hours, which is from mid-morning to 9 P.M., except for the times of inmate "count", of course, when everyone should be back in their resident wing. First there is the law collection, about 700 volumes. (There is also a centralized law library on ultrafiches that is kept on the woman's side. It is available by mail to all other state prisons, and features Federal sources.) As at Bethel, there is an inmate "law librarian" (of "jailhouse lawyer") available, and law books are for library use only. Then there is the donated book collection, mostly paperbacks, which is just under 7000 volumes. It is really a good donated collection, and rewards browsing, but at this time it lacks current reference sources and Alaskana. The present encyclopedias and annual reference titles are far too old, but they do have limited value. There is a recent set of Books in Print, and, as at YKCC, a recent ALN Resource Directory on microfiche.

An Anchorage Municipal Library librarian visits HMCC every two weeks, not only to take any requests for titles and information, but also to bring a large display of paperbacks which inmates can borrow. I have utilized this biweekly service, which can bring ILL books from Washington State as well as major Alaskan libraries, plus any bibliographic or other information we may want. This service, which is funded by the same type of state library institutional service grant used by the Bethel library, provides 20 hours weekly of professional staff time to serve seven institutional facilities in the Anchorage area. Counselling, other than in-house staff, includes a representative from the University of Alaska, Anchorage, Educational Opportunity Center, who is available once a month to give referrals on career choice, educational training and education, financial aid and the application process.

There are no circulation controls for the regular, browsing collection, and one can take books at will, though living units have limits to the quantity of books allowed in one's room. At this time over forty magazine subscriptions are received, but they are so popular that they never seem to be on display. Worse yet, current budget cuts due to a sagging Alaskan economy may eliminate magazine subscriptions altogether, unless other funds can be found. Many inmates receive their own magazines, as well as newspapers from hometowns. Each living unit receives a few subscriptions to the two Anchorage dailies, paid for by inmates.

The open space of the inmate library is taken up by book displays, computers on tables and display units, and chairs for users. The law collection is on one side of the room, in a partitioned space also containing a much used, late model photocopy machine. There is no charge for photocopying of inmate treatment assignments, etc., but approval is required and this limits copying.

Except for the inmate law library mandated by the Cleary decision, there is neither administrative nor statutory provision for the inmate library services within the Alaskan Department of Corrections, so those that are provided depend on the institutional administration's view of such services as helping to make custody control easier, to keep the inmates under control in a stressful treatment setting, and on initiatives taken by the institutional instructors and local public libraries to provide such services. And there is probably humanitarian consideration, and the fact that the trend in most prisons is to at least make a token gesture in the direction of general rehabilitation and purposeful self-improvement. This is especially the case at Hiland Mountain/Meadow Creek, a longer term facility with treatment emphasis.

For Native inmates, however, it is a very different experience from YKCC, where the population is almost entirely Yupik Eskimo, the language is commonly spoken, and the menu in the dining room often features subsistence foods like fresh-caught local whole salmon in season, and frozen cubes of raw whitefish as a snack! At HMCC, where the Native inmates are a minority, they are rather overwhelmed in the heart of the white man's cultural and resident environment. The treatment program involves much writing and speaking in English, and using concepts and terminology that are just as foreign as a conventional library is to someone from a remote subsistence village of a few hundred, despite the presence of school systems in the Y-K delta for several decades, staffed by Kussaq teachers, although Yupik teachers are slowly increasing in number. A smaller percentage of Native inmates make it through the treatment programs successfully, and the Yupik Eskimos from remote villages in western Alaska seem to have the most difficulty, often dropping out, or "going blue" to become maintenance helpers until they are transferred elsewhere, or return to the program to try again. The Department of Corrections and treatment staff are aware of the difficulties facing Native inmates, and are trying to improve matters. Recently legislative aides visited and talked with Native inmates, to get a better appreciation of their experience.

I recall a year or so ago that criticisms made by an accreditation team of the University of Alaska, Fairbanks, alleged neglect of Native and rural education. From what I have observed and learned, in talking with Native inmates, there seem to be significant cross-cultural factors that make any progress for Native inmates more difficult than for the average non-Native inmate. For example, the amount of writing and self-disclosure required, plus an understanding of treatment program concepts and terminology, is more difficult than most Native inmates are ready for.

As for the other services, there is a Native Culture Club, which meets regularly and organizes activities for Natives. Native men will not see much Native programming on television, nor hear it on the radio, and the library collection, having had no circulation controls until now, has not been able to keep any titles on Native culture or Alaska. But there are reasons for this. At HMCC, an inmate can take materials from the library at will. They simply leave, with no controls. So naturally any Alaskan and Native materials disappear from the library almost immediately or pictures are cut out and kept. In the case of some Alaskan publications about Native communities, photos of Native people will be removed because the people in the photos are known by the person cutting them out. Videotapes cannot be owned by inmates, though each wing can watch videos by a centrally controlled system in each house, and a few hundred videos are available to select from. However, only a handful of these are about Alaska and almost none about Native life, but this kind of isolation from Native community and cultural information is about to change. Shortly a Special Collection cabinet will be added to the library, which will house (behind locked cupboards) a selection of current reference, Alaskan and Native titles. An inmate library worker will be in charge of their use, which will possibly be 'library use only' and will maintain the sign-out sheets. Other suggestions include bringing Alaskan and Native videos to the inmate collection, and perhaps a special VCR installation in those wings housing all Native inmates, so their minority preferences would not be overridden by the other three wings in a house which share a VCR. As at Bethel, popular wildlife videos from the U.S. Fish and Wildlife Service could be borrowed, and the State Film Library can loan a variety of northern and Native-subject videos.

Returning to the overall view again, the larger questions about the status and progress of Natives in Alaska are being addressed, aiming to make them full partners in Alaskan life. This will affect library services for Natives, making them more appropriate, and perhaps eventually transferring training capabilities and library management expertise into Native communities.

We should temper our conclusions by reminding ourselves that library services in prisons are basically for recreation and therefore control. Rehabilitation and self-improvement are incidental to the effects of incarceration and deprivation or the court-ordered need to isolate criminals from the community for the time of their sentence. There is really an unparalleled opportunity during imprisonment to try to change attitudes, provide training, education, and follow-up referrals, and increase coping skills. However, this option is largely ignored or declined by legislatures and the voting public. As for serious mental health treatment, apart from facilities like Hiland Mountain/Meadow Creek, the rehabilitation programs we do find are usually of a recreational nature. Library and other special treatment services, especially where they are contracted through an outside library, tend to be of community-level quality. If administered by the institution alone they are often under close budget constraints, and heavily dependent on supportive and enterprising instructional staff.

In the Alaska Department of Corrections the Institutional Instructor is responsible for the variety of recreational programs previously mentioned, whether mandated by law or tolerated by custody administration. At HMCC, Federal Pell grants pay for tuition, fees and books, enabling inmates to take courses from the University of Alaska, Anchorage, and a satellite dish receives telecourses. The main area of study at HMCC has been in computer literacy and application, along with some basic courses in the humanities, and Native inmates have gained computer skills while here. There are many computers in use, both in the library and in living units and dayrooms, and a dues-funded inmate computer club helps stimulate computer literacy and computer-assisted instruction, as well a playing some pretty sophisticated games. UAA course offerings to prisoners will be expanded in Fall, 1992.

How does the Alaskan Native inmate cope in this situation? He is further acculturated in Western and Euroamerican ways, and further distanced from his home village and culture. He learns some skills, but his resentment and frustration with the altering conditions of his traditional subsistence world impacts his manhood and self-esteem. In prison, the Native is forced to become acquainted with libraries and what they offer. But libraries are still largely synonymous with the white man's culture, particularly in a prison setting. However, with appropriate materials, Native inmate staff, and some encouragement to see the usefulness of library resources, this will change. As Native library services across the north become reconstituted from top to bottom as truly homegrown Native information resource centers for educational and recreational support, they can become integrated into Native community life. And as prisons---especially those prisons holding predominately Native prisoners---hopefully become more community-oriented and realistically rehabilitative, Native prisoners will see that their roots have not been cut off, there <u>is</u> hope for their future in the modern world, and young Native boys and girls at home will have fewer causes for despair as they are growing up.

GLOSSARY OF POLAR TERMS: A PROPOSAL[1]

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Abstract

A revision is proposed of the *Glossary of Arctic and Subarctic Terms*, published in 1955 by the Arctic, Desert, Tropic Information Center (ADTIC) as ADTIC Publication A-105, in order to make it more useful to polar researchers in light of advances in technology and changes in terminology that have evolved over the years. One of the objectives in this revision is to convert the 1955 glossary into a *Glossary of Polar Terms* by incorporating the large body of terms that have become commonplace in the multidisciplinary and international research programs in Antarctica since the beginning of the International Geophysical Year of 1957-58. A revised *Glossary* would bridge existing gaps in all subjects relevant to polar areas. A first edition in English may provide the basis for a multilingual glossary if the terminology is generally accepted internationally. Before the laborious process of compiling a revised glossary is begun, comments and recommendations are solicited from librarians, researchers, and other interested users as to the merit of the glossary, its limits of coverage (geographically as well as technical fields), and prospective sources of literature.

Introduction And Background

The ADTIC *Glossary of Arctic and Subarctic Terms*, published in 1955, is a rather comprehensive glossary of 90 pages of terms that are unique to the geographic area intended for coverage. (Copies of the title page and a sample page of terms are included in Appendix 1). It is still a useful reference tool for its purpose, where it is still available, but it has been out of print for many years. A number of military connotations are apparent in some of the definitions because the military services supported the cost of production of the glossary, and it was also produced as "a reference prepared primarily for military personnel and others who are unfamiliar with the specialized vocabularies of arctic literature." (From ADTIC A-105, p.iii). In addition, the "ADTIC ... made a strong effort in preparing the term definitions to focus attention on military needs for operations and survival in the Arctic."

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[1] Author's Note: This paper was not presented at the 14th Polar Libraries Colloquy but because of its relevance is included as a late paper in order to gain comments from its Colloquy audience.

According to the Introduction (p. iii), the ADTIC glossary "may be applied to the Antarctic except in its coverage of terms on endemic flora and fauna." The fields covered ... include astronomy, anthropology, botany, ecology, geography, geology, glaciology and snow and ice terms, ichthyology, meteorology, ornithology, mamalogy [sic], sea ice navigation, exploration, trail terms, and military terminology." Fields of physiology and entomology are incomplete, and the glossary is "most inadequate in the fields of marine invertebrates, mineralogy, and paleontology." Mention is made of future revised editions, but there is no known revision.

Inasmuch as the ADTIC glossary could feasibly serve as an equivalent glossary of some Antarctic terms, it is greatly inadequate in many subjects common to one or both polar areas, some of which are a result of current research issues. For example, there are no entries for ozone, greenhouse effect, global warming, Gondwanaland, dry valleys, endolithic organisms, and *Glossopteris*, some of which are "Antarctic-peculiar," but others are bipolar in nature.

A Revised Glossary

A revision and updating to produce a *Glossary of Polar Terms* is believed necessary because of succeeding changes in terminology, advances in technology, and a need for polar investigators of various nationalities to have a common language and communicate effectively with respect to terminology. Many of these changes have evolved since the beginning of the International Geophysical Year (IGY) in 1957-1958 in Antarctica. Many investigators have bipolar research programs, and a glossary of terms encompassing both poles would be a considerable asset to them as well at to others. A revision would not necessarily exclude military applications, as appear in the ADTIC glossary, because of the current widespread use of military logistic support for the conduct of research programs in both polar regions. However, a revision would de-emphasize the focus on military needs that is found in the ADTIC glossary.

Many of the terms and definitions proposed for *Glossary of Polar Terms* already are found in a number of separate glossaries compiled for particular purposes (see examples in the Bibliography), but others are not. It is not intended to simply reproduce and incorporate existing valid glossaries of terms into a new glossary, but instead to include selected terms and definitions of most use to polar investigators. Unusually specialized terms can still be referred back to an existing glossary for a more complete definition. New terms, i.e., those proposed in the literature since a relevant glossary was published, would be included with a complete definition in the proposed *Glossary of Polar Terms*. Considering the obsolescence of a number of glossaries of polar-related terms, updating of definitions and the inclusion of new terms would be a genuine asset in a new, all-inclusive glossary.

As an example of only one subject field, it should be noted that the Polar Research Board's Ad Hoc Study Group on Permafrost (1974, p. 53) recommended the development of an international glossary of permafrost terms as a major step toward clarity of writing and interdisciplinary and international communication.

One person or two cannot hope to assemble all relevant terms and proper definitions and judge which should be included or excluded. Instead, lists of prospective terms and definitions will be compiled in draft form and distributed to specialists in various disciplines of polar sciences and technology for review. Their critiques will provide the basis for improving the drafts and preparing a final compilation of a revised *Glossary of Polar Terms.*

Of great value in this effort will be the resources of the Center for Northern Studies in Wolcott, Vermont, U.S.A., and its Director, Dr. Steven B. Young, co-worker on this proposed glossary project. Dr. Young has devoted most of his career as a botanist to the North, as well as several summers of research in Antarctica, and is the author of a widely used reference book on the Arctic (*To the Arctic: An Introduction to the Far Northern World*, John Wiley, 1989, 354 pp.). Dr. Young has also compiled a glossary of northern terms as a result of seeing a need to provide a comprehensive set of definitions for continuing use by his students and others active in northern areas. This unpublished glossary of terms will provide the basis for integrating and cross-checking with terms in the ADTIC glossary, as well as forming a start for "Antarctic-peculiar" terms.

Dr. Young's background is vital in managing the Arctic/sub-Arctic area in the evaluation and compilation of terms and definitions, whereas the author's experience is mainly in Antarctica: (1) 1960-1986, eight research programs in geologic field mapping, mineral resource evaluation, ice drilling, and field logistics; (2) 1964-67, Library of Congress, *Antarctic Bibliography* project, and *Bibliography on Snow, Ice, and Frozen Ground*; and (3) since 1983, as naturalist/lecturer on tourist ships to Antarctica and the Arctic.

Work Plan

1. Visits will be made to selected libraries which have comprehensive collections of literature that is unique to polar research. One of the more time-consuming tasks involved in tracking down all relevant terms and accurate definitions is in determining where they can be found and what the most efficient procedure might be in the collecting phase of the project. Polar libraries are unique for this purpose because of specialized card catalogs and subject indexes, reference volumes, and technical and research staff associated with their parent organization. Discussions with investigators at those institutions and in-depth reviews of library holdings will aid in locating additional relevant terms, determining accurate definitions, and also help to establish the overall format of the revised glossary. Key libraries proposed for this study are at the Byrd Polar Research Center, Ohio State University, Columbus; Institute of Arctic and Alpine Research, University of Colorado, Boulder; U.S. Army Cold Regions Research and Engineering Laboratory, and also the library at Dartmouth College, both in Hanover, New Hampshire; Scott Polar Research Institute, Cambridge, England; the Geological Survey of Greenland, Copenhagen, Denmark;

and the Rasmuson Library at the University of Alaska Fairbanks. Searches using the *Arctic and Antarctic Regions* CD-ROM published by the National Information Services Corporation (NISC) and *Polar Pac* CD-ROM published by the Western Library Network (WLN) will identify relevant literature and terminology, as well as the holdings of the key libraries. Source literature for many of the definitions will still need to be consulted in polar libraries.

2. Draft copies of terms and definitions will be distributed to specialists in various disciplines and operational techniques. Their critiques will be edited and incorporated into the master file stored on word processor discs.

3. Publication will follow in order to make the revised *Glossary* available to users. A suitable publisher will be determined at a later time.

Invitation For Comments

Librarians are among the audience of users of a revised *Glossary of Polar Terms*, hence comments and recommendations are solicited here in order to provide a starting basis for compilation and to solicit answers to questions such as the following:

1. Is there a need for the proposed revision of a *Glossary of Polar Terms*, or do existing glossaries provide what is proposed (albeit not in a single volume)?
2. The proposed geographic boundaries of the *Glossary of Polar Terms* would also include "sub-Arctic" and "sub-Antarctic." Is this a useful approach?
3. What are working definitions of "sub-Arctic" and "sub-Antarctic"?
4. Is there a need to conduct site visits at key polar libraries (examples mentioned above) in order to search for and verify polar terms and accuracy of definitions?
5. If so, in order to avoid redundancy and unnecessary travel and effort, what are the essential polar libraries (or other resource institutions) that should be consulted?
6. What are the subject fields that should be included in the proposed *Glossary* (specifically, as per those listed above in ADTIC Publ. A-105)? Are there subject fields that should receive more detail? Less detail?
7. In addition to those references in the Selected Bibliography (below), what are others which serve as useful background references for compilation of terms?

Other related comments and suggestions would be appreciated. This project will be proposed for support by an appropriate funding agency (or agencies), and will be under the co-direction of the author and Dr. Steven B. Young, Director, Center for Northern Studies, Wolcott, Vermont. Please direct comments to the following, no later than **February 28, 1993.**

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These comments will be incorporated into a paper (essentially a version of a formal proposal) that will be presented at the next Polar Libraries Colloquy in order to provide a progress report and a forum for further discussion.

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APPENDIX 1

GLOSSARY OF ARCTIC AND SUBARCTIC TERMS

ADTIC Publication A-105

Arctic, Desert, Tropic Information Center
RESEARCH STUDIES INSTITUTE
Air University
Maxwell Air Force Base, Alabama

September 1955

GLOSSARY OF ARCTIC AND SUBARCTIC TERMS

A. 1. In the U. S. Weather Bureau teletype code, abbreviation for 'hail.' 2. In the Bergeron system of air mass classification, abbreviation for 'arctic air mass.'

aapa, *n.* A Scandinavian name for a sphagnum bog occurring in a coniferous forest. Sometimes called a 'wood-moss moor.'

Abbato-Dene, *n.* A subdivision of the Dene (which see, sense 2) occupying the center of the Yukon Territory, northwestern Canada, from Dawson eastward through the Stewart River drainage.

ablation, *n.* 1. The process of removal of snow or ice from a glacier or snowfield by melting and evaporation. 2. The amount of snow or ice removed by this process.

Ablation is used by some authorities to include any process which reduces the mass of a glacier or snowfield. This sense includes wind erosion, corrasion, and calving. Cf. **wastage,** *n.* Also attrib., as in *ablation area, ablation zone.*

ablation area. That part of a glacier or snowfield where ablation exceeds accumulation. Also called 'area of dissipation' or 'dissipator.'

ablation cone. A debris-covered mound of ice, firn, or snow formed by differential ablation. Also called 'dirt cone,' 'debris cone.'

ablation form. A feature formed by melting or evaporation of a snow or ice surface.

'Nieve penitente,' 'ploughshare,' and 'ice pyramids' are examples of ablation forms.

ablation moraine. In glaciology, a layer of debris, originally enclosed in the body of the glacier, which accumulates as the surface ice is removed by melting or evaporation. *Specif.*, a layer of loosely consolidated till, usually thinner than ground moraine, resting on ground moraine derived from the same glacier.

abrasion, *n.* The act or process of rubbing away a ground surface or formation.

Abrasion of a valley takes place largely through glacier or stream actions, of a snow surface by wind-driven snow, of a shore line by ice and wave actions.

acclimate, *v. intr.* To become conditioned physiologically and mentally to an extreme or new climatic environment.

acclimatization, *n.* In general, any adjustments or adaptations, physiological, psychological or social, which enable an individual or organism to live in closer accord with an extreme or new climatic environment. *Specif.*, the functional and structural adjustments of a body or other organism which increase its efficiency to meet the demands of an extreme or new environment; the bodily changes which tend to reduce energy loss. Cf. **accustomization,** *n.* and **adaptation,** *n.*

acclimatize. 1. *v. intr.* Pertaining to the human body or other organism: To adapt functionally or structurally in response to variant conditions of an extreme or new climatic environment. 2. *v. tr.* To cause or enable an organism to make functional or structural adaptation in order to be better qualified to meet the stresses of an extreme or new climatic environment.

accumulation, *n.* The snow and other solid precipitation deposited on a glacier or snowfield; the quantity deposited. Also attrib., as in *accumulation area, accumulation zone.*

accumulation area. That part of a glacier or snowfield in which accumulation exceeds wastage. Also called the 'surplus area.'

accumulation zone. In respect to an avalanche, the area in which the bulk of the snow in the avalanche was originally deposited.

accustomization, *n.* The process of learning the techniques of living comfortably, or with a minimum of discomfort, in an extreme or new environment. Cf. **acclimatization,** *n.* and **adaptation,** *n.*

acicular ice. Fresh water ice consisting of numerous long crystals and hollow tubes having variable form, layered arrangement, and a content of air bubbles. This ice often forms at the bottom of an ice layer near its contact with water. Also called 'fibrous ice' or 'satin ice.'

acid bog. Sphagnum bog.

acid moor. A British term for a sphagnum bog. See **moor,** *n.*, sense 1.

aconite, *n.* Monkshood.

acrocyanosis, *n.* Medical term for chilblains.

active glacier. A glacier which has an accumulation area, in contrast to a stagnant glacier.

An active glacier need not have an advancing front.

active layer. The stratum of ground above the permafrost table which is subject to seasonal freezing and thawing. Also called 'suprageliso1,' 'suprapermafrost layer,' 'frost zone.'

active method of construction. The method of preparing a foundation for new construction whereby all of the soil and vegetation above the permafrost table are removed and replaced with an insulating blanket of coarse-grained material.

active permafrost. Perennially frozen ground which, after thawing by natural or artificial means, reverts to permafrost under present climatic conditions.

This term differentiates between the active layer and ground usually frozen but which may become thawed during an especially warm summer or by artificial means. Active permafrost is weak during an unusually warm summer, whereas the active layer is a potential problem in construction and transport every summer.

- POSTER SESSION -

A NEW CIRCUMARCTIC MAP OF PERMAFROST AND GROUND ICE CONDITIONS

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The International Permafrost Association (IPA), comprising eighteen adhering national organizations, approved the compilation and publication of a circumarctic permafrost map at its June 1990 Council meeting in Quebec City, Canada (see Resolution; Table 1). The IPA recognized the need for a single, unified international map to depict the permafrost distribution and properties of the Northern Hemisphere at a scale that would be useful to both permafrost and non-permafrost specialists concerned with sources and sinks of greenhouse gases, resource development and protection of the environment. It was agreed to produce the map for the Sixth International Conference on Permafrost to be held in Beijing in July 1993, and that other national and international scientific and engineering organizations would be notified of the project and their cooperation and participation invited. The project is being coordinated by the IPA Editorial Committee and consists of five major steps: (1) legend development, (2) initial compilation for North America and Russia by the authors of this abstract, (3) additional input by national experts for China, Mongolia, the Nordic countries and for other areas, (4) review and revision, and (5) final cartographic preparation and printing.

A preliminary legend was agreed to in Anchorage, Alaska, in September 1991 and revised by the authors in Ottawa, Canada, in April 1992. Map scale is 1:10,000,000, a Lambert Azimuthal Equal Area and polar projection are employed, and the map extends southward to include permafrost conditions in Tibet and the Rocky Mountains in North America. The principal components of the legend consists of: estimated areal extent of permafrost terrain (90-100%, 50-90%, 10-50%, 0-10% and no permafrost present); an estimate of relative abundance of ice in the upper 10-20 meters as percent volume (greater than 20%, 10-20%, less than 10%); relative abundance and/or occurrences of ice wedges, massive ice bodies and frost mounds, and submarine and relict permafrost; ranges of permafrost temperatures (C) and thicknesses (meters) and lithology and genetic origin of the deposits. An accompanying manuscript will present a brief history of permafrost mapping, principles and approaches employed in the present compilation, and future international mapping needs. The map attributes eventually will be available in a digital form. The map should also serve as a base for other thematic maps such as soils and vegetation.

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For purposes of this Colloquy, a brief history of permafrost mapping seems appropriate and is based to a large extent on the paper by Heginbottom (1984). According to Nikiforoff (1928) and Baranov (1959), the earliest known map depicting permafrost is of Siberia published in 1882 by G. Vil'd and shows the southern boundary of the "everfrozen region". The earliest map for North America is credited to Andre in 1913 by Baranov (1959), but unfortunately the reference is not cited and the original work is not identified. Since these early efforts, over 150 different maps of permafrost and related phenomena have been compiled and published. Heginbottom (1984) groups these maps into four categories:

1) Miniature maps of the world, the northern polar regions, or the northern hemisphere continents showing the distribution of permafrost as known at the time of their compilation. These maps range in scale from about 1:30,000,000 to about 1:50,000,000. Examples are the maps by Black (1954) and Péwé (1983) and the one illustrated in Figure 1 from Heginbottom (1984).

2) National maps showing the distribution of permafrost for the politically defined areas. Scale and level of detail vary widely according to the size of the area covered and can be grouped according to size as single-page maps typically at a scale of between 1:50,000,000 and 1:10,000,000 and atlas or wall maps on large sheets at scales of between 1:10,000,000 and 1:2,500,000. Examples of the first subclass are Rapp and Annersten's map (1969) of discontinuous permafrost in Sweden, Weidick's map (1968) of the extent of permafrost in Greenland and Ershov's compilations (1988,1989) of the Former Soviet Union. Examples of the latter maps include Brown (1978) of Canada, Shi et al.(1988) of China, Ferrians (1965) of Alaska, and Popov et al. (1985) of the USSR and the North American (1990).

3) Regional and local maps of permafrost or ground ice conditions or related features are available at a variety of scales. Some examples of these maps are: Melnikov (1966) of Yakutia, Péwé (1982) of the Fairbanks area, Baulin et al. (1982) of West Siberia, Tong et al. (1982) of the Qinghai-Xiang Highway, and Heginbottom and Radburn (1991) of northwestern Canada.

4) Maps of various areas showing the former extent of permafrost or the distribution of features indicative of the former occurrence of permafrost conditions such as Kaiser's map of western and central Europe published in Washburn (1990).

Maps are also grouped by their contents or legend, the most common showing the extent and distribution as defined by climatic conditions usually divided into the continuous and discontinuous zones (e.g. Brown, 1973). Some maps in this group show areas of alpine or mountain permafrost (e.g. Brown, 1967 and Gorbunov, 1978) and subsea permafrost (Mackay, 1972 and Péwé, 1983). A second set of maps show specific attributes such as thickness and temperature of permafrost (Judge, 1973; Ershov, 1989) and the distribution of geomorphic features indicative of the occurrence of ground ice, of frozen ground, or of the former extent of frozen ground (Popov et al., 1966), including pingos (Hughes, 1969), ice-wedge polygons or ice wedges (Shumskiy and Vtyurin, 1966), and ice-wedge casts

(Williams, 1969). A third group of maps relates permafrost conditions to environmental conditions including temperature (Crawford and Johnston, 1971), extent of glaciation (Hughes, 1973), and geology, hydrology or vegetation (e.g. Ferrians, 1965; Fotiev, 1978; Bliss, 1979). Complex maps contain environmental, permafrost and ground ice information and more frequently have been prepared in the Former Soviet Union (e.g. Kudryavtsev et al., 1978; Melnikov, 1966; Fotiev et al., 1978; Vtyurin, 1978; and Ershov, 1989).

An abbreviated bibliography of the maps cited above and other relevant maps and papers are presented in the following list of references.

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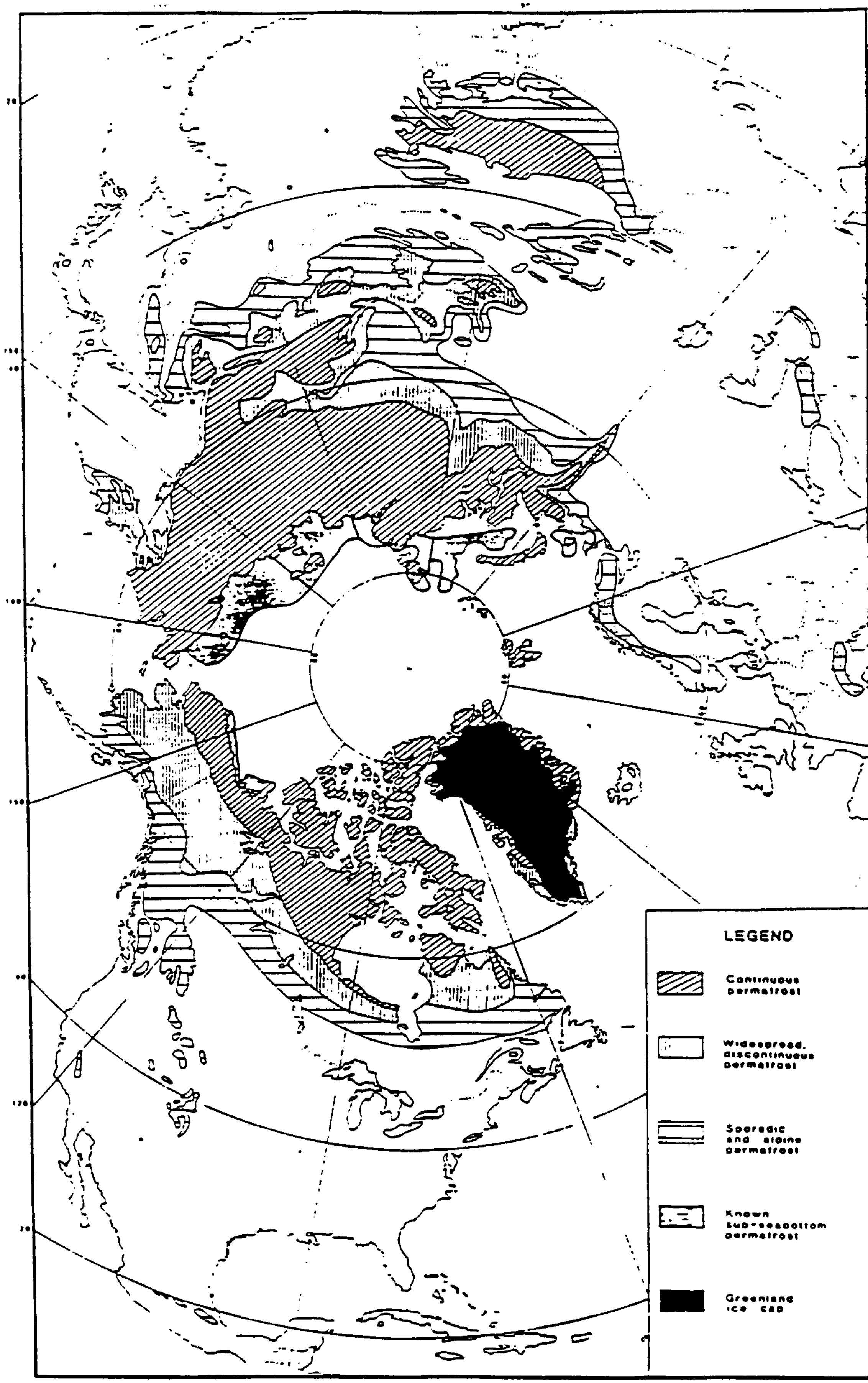

Figure 1 Generalized distribution of permafrost in the Northern Hemisphere (modified from Heginbottom. 1984).

Table 1: Resolution-International Permafrost Association
(Approved June 6, 1990, at the IPA Council meeting, Quebec City, Canada)

WHEREAS the distribution and properties of permafrost are of increasing interest to non-permafrost specialists, and particularly to those concerned with assessing the impacts of climate change on northern regions;

WHEREAS regions underlain by permafrost and containing organic rich soils are potential sources and sinks of radiatively active trace gases (carbon dioxide, methane, etc.) that contribute to the greenhouse effect;

WHEREAS no single, circumpolar map exists at a scale and with a common legend useful for observing, depicting, or assessing the proposed changes in permafrost degradation and other biogeographic zonation (scale of approximately 1:7,500,00);

WHEREAS an understanding of permafrost distribution and properties is important to the protection of the northern environments for both development and conservation purposes;

Be it RESOLVED that the IPA, consisting of 18 adhering national bodies, undertake the compilation, editing and production of a circumpolar map depicting the current knowledge on permafrost distribution and boundaries in the Northern Hemisphere;

FURTHERMORE, the IPA notify other international and national scientific and engineering organizations that such a project has been initiated and that their cooperation and interest are welcome;

Finally, be it RESOLVED that the IPA establish the organizational mechanism and schedule to produce this map prior to the Sixth International Conference on Permafrost to be held in Beijing in July 1993.

- EDITOR'S OF POLAR JOURNALS SESSION -

POLAR JOURNAL PANEL

Summary by
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Representatives and editors of polar journals were empaneled to discuss the history, current practices, and future plans for their respective publications before an audience of primarily journal users. The intent of the session was to have editors meet one another, and to learn about reader concerns from their subscribers and users.

During the 1 1/2 hour session, presentations were made by Jerry Brown discussing several scientific publications: *COLD REGIONS SCIENCE AND TECHNOLOGY, GEOCRYOLOGY, POLAR GEOGRAPHY AND GEOLOGY, JOURNAL OF GLACIOLOGY AND GEOCRYOLOGY.* Karen McCullough, editor of *ARCTIC*, discussed her journal and its relationship to the Arctic Institute of North America in Calgary. Winifred Reuning of the United States National Science Foundation described the *ANTARCTIC JOURNAL OF THE UNITED STATES* which she edits. Kathleen Salzberg of the University of Colorado in Boulder described her journal *ARCTIC AND ALPINE RESEARCH*, followed by David Walton of the British Antarctic Survey who introduced the journal *ANTARCTIC SCIENCE.*

Through the individual commentaries many differences became evident among the journals: purposes and philosophies, sponsorship, readerships, subject areas, etc. Some were self-supporting and tied to organizational memberships; others were printed to comply with publishing protocols of national and international research programs. Several were closely focused on specific disciplines while others were cross-disciplinary. The editors have experimented widely on the mix of materials -- papers, news, controversial topics, professional meeting notices, conference proceedings, etc.

Although these differences were significant, all the editors were eager for responses from readers and manuscripts for future issues. With few exceptions, the solicitation and review processes for papers were of great concern not only to the editors but also to the researchers and librarians in the audience who found the journals being used for faculty evaluation and promotion purposes oftentimes via citation index studies, etc. The editors were eager to refer papers to more appropriate journals.

Walton was unique in having conceptualized and designed *ANTARCTIC SCIENCE*; the other editors largely inherited journals with distinct goals and existing procedures. The editors clearly presented the difficulty of working with authors tardy in rewrites, keeping an active stable of authors and peer reviewers, and keeping their journals solvent in uncertain financial times.

Journal publishing is increasingly becoming an in-house activity with the aid of better computer software; however, some professional organizations farm out their journals to commercial publishing houses for varied reasons ranging from lack of volunteer editors to better marketing access. Subsidies from diverse sources to maintain reasonable subscription prices for the readership varies widely except when the publications are provided gratis and serve a general public education obligation or need. And access to this "grey" literature remains a need for both users and producers.

Individuals seeking further information about any of the journals represented should contact the editors directly. Throughout the panel discussion it was clearly evident that the editors are eager to serve their disciplines, the authors, and ultimately the users -- the larger library and information community.

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